BEECH OVENS™
WORLD LEADER IN SPECTACULAR COOKING EQUIPMENT

36 Gladys Street, Stones Corner,
Queensland, Australia, 4120
Tel: (617) 3397 0277
Fax: (617) 3397 0030
e-Mail: sales@beechovens.com.au
Web: www.beechovens.com
ABN 14 115 371 741

Installation and Operation Manual

RND - REC - RGO Oven Series

(Revision 1 – July 2011)

To obtain the best results from your Beech Oven, please read this manual in it's entirety before operation.

© Beech Ovens Pty Ltd 2010

BEECH OVENS™
WORLD LEADER IN SPECTACULAR COOKING EQUIPMENT

36 Gladys Street, Stones Corner,
Queensland, Australia, 4120
Tel: (617) 3397 0277
Fax: (617) 3397 0030
e-Mail: sales@beechovens.com.au
Web: www.beechovens.com
ABN 14 115 371 741

BEECH OVENS WARRANTY CARD

FAILURE TO RETURN THIS CARD MAY VOID OVEN WARRANTY

All details need to be completed in the chart below. Please view the Installation and Operation Manual and Pre-fire video documents prior to installation.

I have received, viewed and understood the following:

- **Beech Installation and Operation Manual** supplied with the oven.
- **Beech Pre-fire Video** on CD which gives important instructions to follow before firing the oven for the first time.

Name:	Signature:
Purchaser:	Oven installation location:
Model Number:	Serial No:
Warranty Start Date:	

The completed warranty card must be returned to Beech Ovens by one (1) of the following methods:

Email: **technical@beechovens.com.au**
Fax: **+617 3397 0030**
Certified Mail: **P.O. Box 1577**
Coorparoo DC,
Brisbane, Australia, 4151

Warranty conditions:

The main body of the Stone Hearth and Tandoor ovens consisting of steel, refractory and insulation shall be free from defects in materials and workmanship for a period of four (4) years from the date of purchase. All other equipment including accessories to Stone Hearth and Tandoors ovens, Char Grills, Bread Ovens and all other custom equipment shall be free from defects in materials and workmanship for a period of one (1) year from the date of purchase.
All gas and electrical components and accessories shall be free from defects in materials and workmanship for a period of one (1) year from the date of purchase.

This warranty does not apply;

1. To shipping or transit damage, incorrect installation, product modifications or abuse of the product. Installation must be carried out according to the Beech Ovens Installation and Operation Manual and Pre-Fire video.
2. In cases where the customer uses water to clean any part of the oven whilst it is at operating temperature.
3. For normal cracking due to expansion and contraction of the oven roof, wall and floor.
4. If the data/rating plate has been removed or made unreadable.
5. For the cost of customs duty or import taxes.
6. For labour costs to change over replacement parts.

CRITICAL ISSUES TO BE CONSIDERED

1. **Beech Ovens must be installed with adequate ventilation allowance both above and below the oven including tube burner vent device. (Refer pages 37 – 42)**
2. **When using spray filters, ensure all necessary services are considered and installed as required. (Refer page 58).**
3. **When using gas systems, ensure the correct supply pipe sizes are installed to operate gas system on full load. (Refer original drawing & page 119 - for gas usage)**
4. **For correct fitment of enclosures or facades, refer to original supplied drawing for all dimensions including critical recommended 'Air Gaps' for efficient insulation. (Refer also page 19)**
5. **On ovens supplied with windows, ensure the supplied vent device is connected correctly to the exhaust system. (Refer page 62)**
6. **Avoid using combustible materials on the oven body when building surrounding enclosures and facades. (Refer page 13)**
7. **Oven installations require correct air flow requirements with suitable temperature rated fans for correct operation. (Refer page 31)**
8. **Ensure power supply to the gas control system is correctly wired as the system is "Polarity Sensitive ". (Refer page 64)**
9. **Follow correct "Heat-Up" procedures to avoid damage to the oven when initially commissioning the oven. (Refer pages 86 – 88)**

Contents

Section 1 - Installation 7
Important Information 8
WARNING: 8
For your safety 8
Disposal of ashes 8
Oven Overview 9
Preliminary checks 11
Site Preparation 12
Protection of Combustible floors 13
Oven Installation Procedure 14
Lifting Positions 14
Transportation 15
Assembly 16
Stainless Steel Hearth 20
Flue Connection 21
Flue Transition 21
Spray Filter 22
Spray Filter - Technical Specifications 23
Interlock System - Australian markets ONLY. 24
Water Flow Sensor - UK market ONLY 26
Exhaust Duct Design 27
Flue Material 27
Recommended Flue size 27
Nominal airflow required (at Flue Connection) 27
Methods of Exhaust ducting 28
Method 1 – Natural Draft 28
Method 2 – Use of Exhaust Fan 29
Method 3 – Use of Existing System 29
Method 4 – Use of a Beech Ovens Spray Filter 30
Spray Filter normal operating Temperatures and Air flow volumes 31
Method 5 – Canopy Method 32
General Information on Flues 34
Flue Fires 34
Possible cause of Flue fire 35
Possible cause of fire behind the façade 36
Ventilation Requirement 37
Tube Burner Ventilation 38
Installing the Tube Burner Vent 39
Gas Systems overview 43
Gas Control Cabinets 43
Gas Control Cabinet Functions 45
Main Control Switch 45
Burner On Indicator Light 45
Fault/ Reset button 46

Digital Temperature Controller 46
Gas Burners 47
Tube burner 47
Display burner 47
Gas Char Grill 47
Tri-Electrode/ Igniter Assembly 48
Thermocouple 49
Duck Oven Thermocouple 51
System Connection 52
Contractors Responsibility 52
Venting the Oven 52
Connection Procedures 53
Char Grill Connection 56
Double Burner Installations 57
Spray Filter Connection 58
Window Installation 59
Window Vent Connection 62
Spotlight Connection 63
Electrical Connection 64
Final Checks 64
Installation Checklist 65
Section 2 - Commissioning 66
Commissioning 67
System Damper Calibration 68
Oven Draw *(Suction)* variables 68
Cool Air Make-up check 69
The A4 Paper Test 70
Ventilation Test 72
System Balancing 73
Flame Calibration – Sit Nova 826 75
Setting High and Low Flame Pressure 76
High Flame 77
Low Flame 78
Flame Calibration - Char Grill 79
Inspirator Calibration 80
Installation & Commissioning Check Sheet 82
Installation Check Sheet 83
Commissioning Check Sheet 84
Section 3 – Operation 85
Preheating with Gas 86
Preheating with Wood 87
Adjustments for Normal use 88
Firing up to Cook 89
Gas Control Cabinet Functions 90
Main Control Switch 90
Burner On Indicator Light 90

Fault/ Reset button....91
Digital Temperature Controller....91
Temperature Control Procedures....92
Using Gas only....92
Using Gas and Wood....92
Using Wood only....93
Gas Ovens....93
Combined Wood and Gas....93
Wood Fired Ovens....93
Char Grill....94
Lighting the burners (Char Grill)....94
Replacing the Char Grill Piezo Battery....95
Finishing for the Day....96
Plug Door placement....97
Section 4 – Maintenance & Technical Specifications....98
Oven Maintenance....99
Tri-Electrode and Burner Maintenance....103
Tube Burner....103
Display Burner....106
Char Grill Maintenance....108
Window Maintenance....109
Cleaning the Internal Glass....109
Spotlight Maintenance....111
Spray Filter Maintenance....112
Spare Parts List....113
General Technical Details....119
CE Specifications....120
Oven Materials....121
ECFIA General MSDS....122
Troubleshooting Guide....129
Index....133

Introduction

This manual outlines the recommended methods and procedures for installation and operation of a Beech Oven. Improper installation, adjustment, alteration, service or maintenance can result in property damage, injury or death. It is strongly advised that any personnel involved with the installation, commissioning or maintenance of the oven, read this manual in its entirety before installing or servicing this equipment.

Failure to follow the recommendation of the content of this manual, or the advice of Beech Oven personnel, may result in property damage, serious injury or death.

Failure to follow the recommendation of the content of this manual, or the advice of Beech Oven personnel, will **void the manufacturers warranty and liability.**

A warranty document is supplied with every Beech Oven. It is compulsory that this document be completed and returned to Beech Oven's Head Office in a timely manner. Failure to do so will void the warranty of your product.

The following information is compiled to ensure that your Beech Oven is installed and maintained to provide it's safest and most efficient performance at all times.

All measurements shown are as a guide only. Refer to design documentation and technical specifications for correct dimensions.

Contact Information

Beech Ovens Head Office:
36 Gladys St
Stones Corner
Brisbane Qld 4120
Australia

Postal Address:
PO Box 1577
Coorparoo DC 4151
Brisbane, Australia

Tel: +61 (0)7 3397 0277
Fax: +61 (0)7 3397 0030

Web: www.beechovens.com
E-mail: sales@beechovens.com.au
Technical Support: technical@beechovens.com.au

Section 1 - Installation

Installation

Important Information

WARNING: Improper installation, adjustment, alteration, service or maintenance of a Beech Oven can result in property damage, injury or death. Read the installation, operation and maintenance instructions thoroughly before installing or servicing this equipment.

It is recommended that suitably qualified professional personnel install this oven.

Installation of the exhaust system must be in accordance with your local authority guidelines.

The oven flue must be inspected at three monthly intervals to determine if soot, oil or carbon deposits have occurred. If deposits have accumulated, these must be removed to reduce the risk of fire *(refer to the **Maintenance** section in this manual)*

For your safety

- Never use gasoline, gasoline-type lantern fuel, kerosene, charcoal lighter fluid, or similar liquids to start or 'freshen up' a fire in this oven. Keep all such liquids well away from the oven when in use.
- Do not in any way block the required air spaces with insulation or other materials. Ventilation must be maintained.
- Do not use products not specified for use with this oven.
- Do not over fire. If flame spills out of the oven opening, you are over firing.

Disposal of ashes

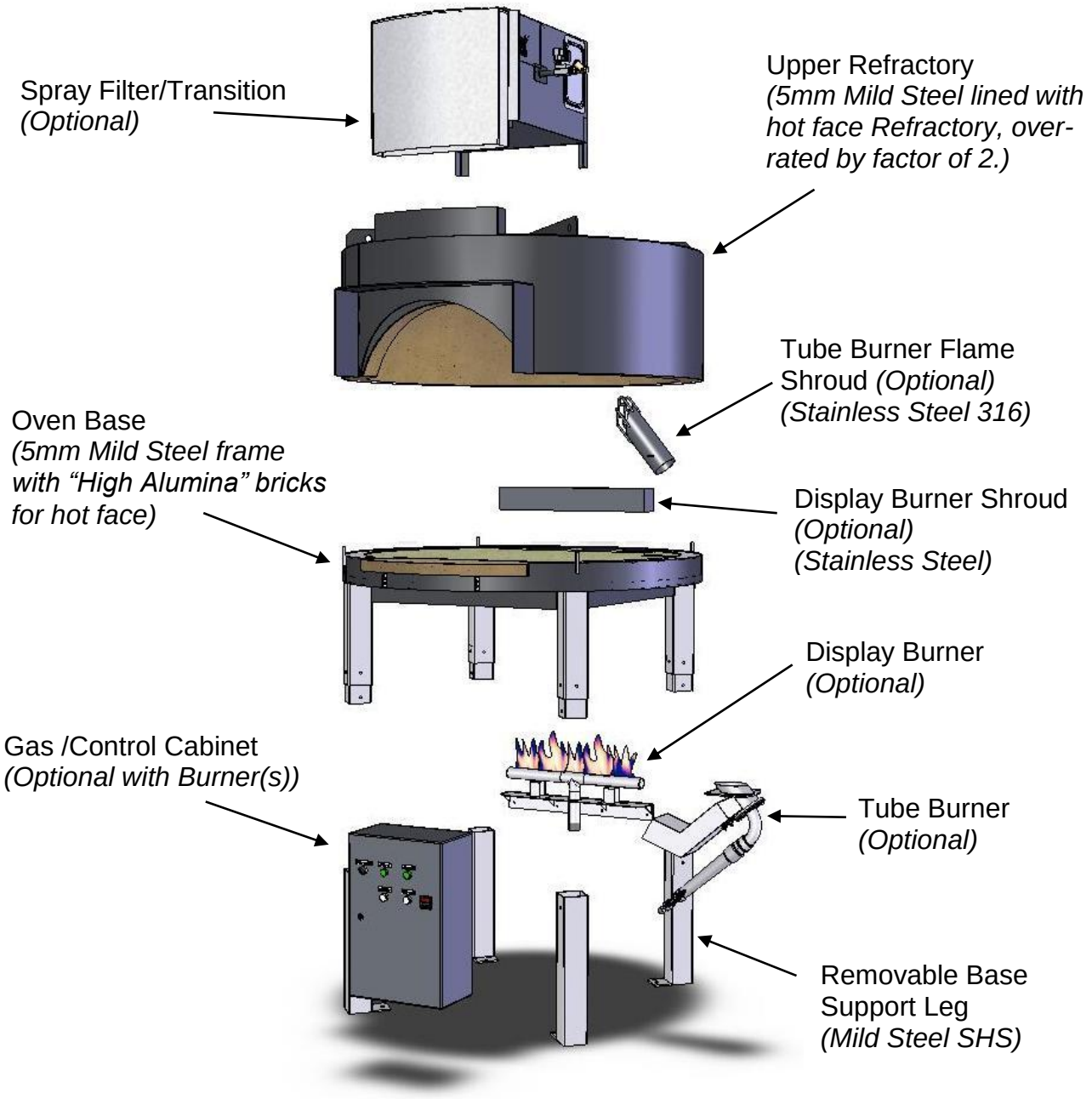
Ashes should be placed in a metal container with a tight-fitting lid. The closed container of ashes should be placed on a non-combustible floor or on the ground, well away from all combustible materials, pending final disposal. If the ashes are disposed by burial in soil or otherwise locally dispersed, they should be retained in the closed container until all cinders have thoroughly cooled. Local regulations may apply.

Retain this manual for future use

Additional copies of this manual are available from Beech Ovens, online or from your local Beech Ovens representative.

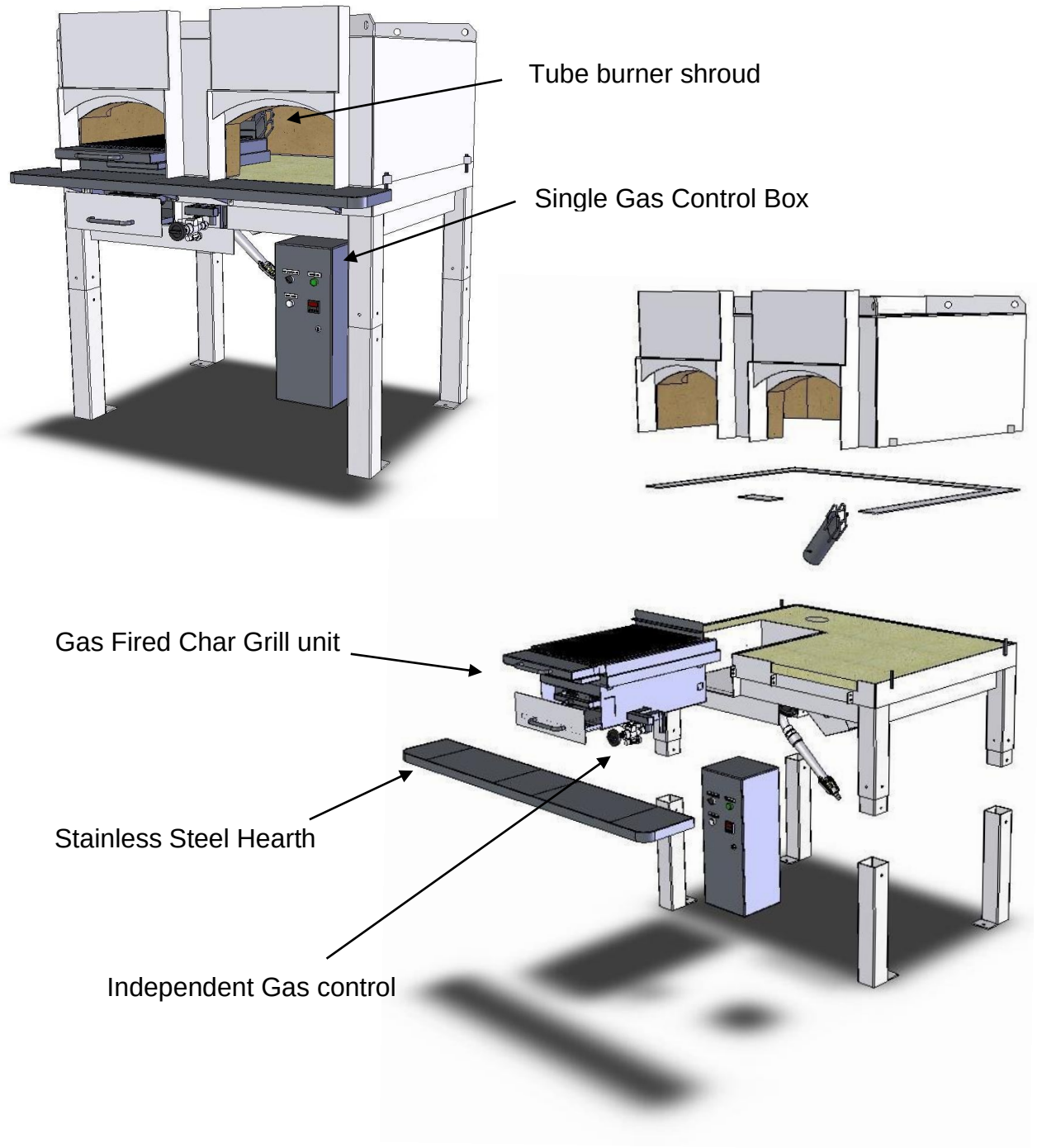
Oven Overview

Due to the many variations of Beech Ovens the following ovens are an outline as to the most common components that make up a standard construction.



Note: *This diagram shows a Round RND1300 oven with both a Display burner, Tube burner and a Spray Filter. Your particular Beech Oven may not include the listed Options as displayed.*

The following is an outline of the Rectangular Grill Oven or RGO1250. Many components are the same as the previous RND1300 Round oven, though the RGO1250 has the added feature of an in-oven Gas fired Char Grill.



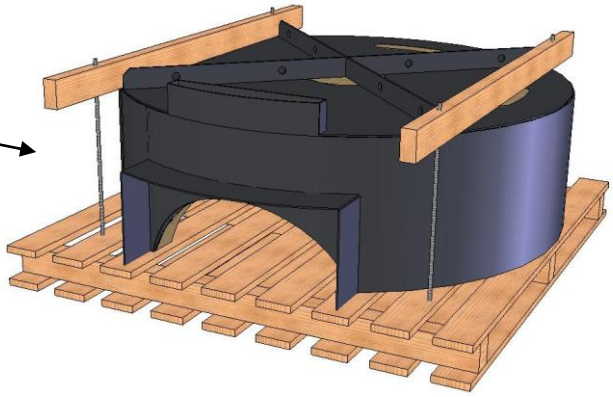
Note: *This oven features the Tube burner directly behind the grill. Other options and configurations, including a Display burner, are available on request.*

Preliminary checks

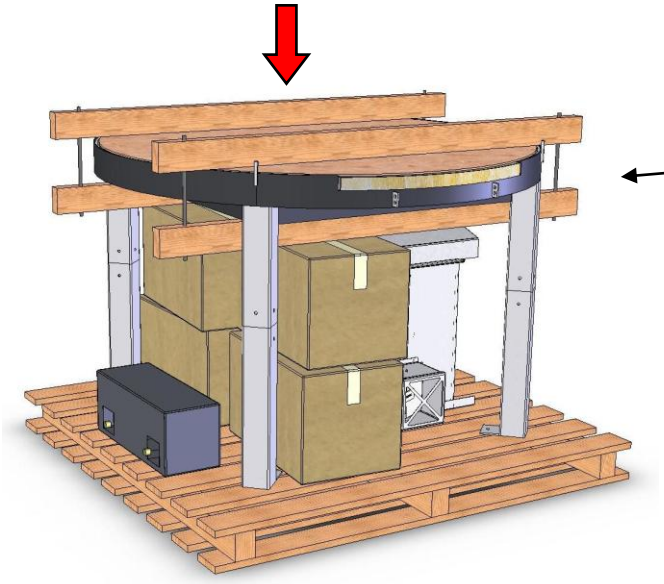
The oven is transported by truck, ship or plane to its destination. The oven is shipped in two halves; the Upper Refractory and the Base. *(The consignment document is a good check to establish the correct oven weight.)*

Upper Refractory on pallet. *(Weight between 500kg - 1800kg)*

Check carefully for transit damage prior to unpacking. *(Document damage with photos and report to supplier)*



Do NOT remove clamps or Plywood



Oven Base on Pallet. *(Weight between 400kg - 1100kg)*

Check that all parts and accessories are present and free from transit damage. DO NOT remove plywood sheet from top of oven, until base is in position for final assembly.

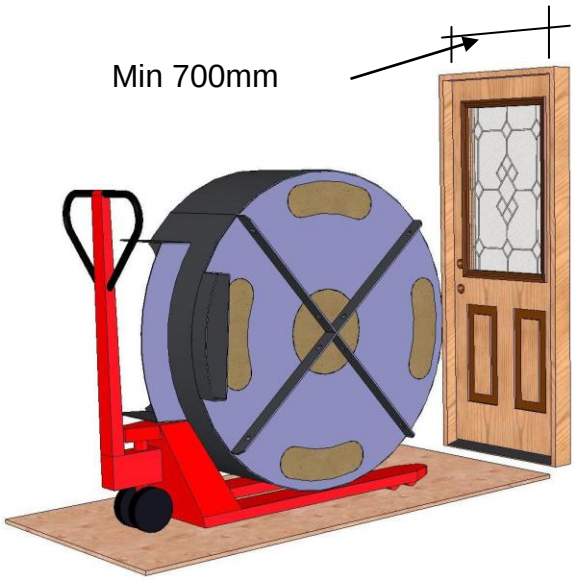
Note:
It is strongly recommended to use proper lifting equipment for the transportation and placement of these components. DO NOT attempt to move these items by hand or by any other means that may damage the goods or injure personnel.

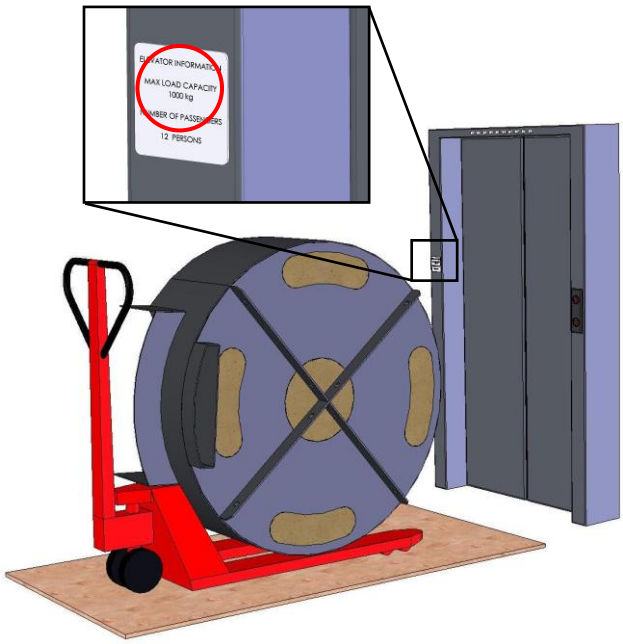
Site Preparation

Once on the ground, the method of installation is dependent on the type of access. If there is level access of sufficient width e.g. 1600mm *(in the case of the round RND 1300 model)* and no stairs, the oven can be moved by pallet trolley or forklift to its desired location.

In the case where access includes navigating through narrow corridors and stairs, both halves of the oven must be individually placed on their edge on a pallet trolley *(or similar)* and moved through the narrow passages.

(Be sure to secure the oven to the trolley during transportation using ropes or strapping)





Leave timber supports on base when transporting

The oven top and base will fit into a standard elevator. Be sure to check elevator load capacity is adequate.

For installation purposes, we utilize thick sheets of ply to spread the weight of the oven when we transport it over any surface which may be damaged by the wheels of the trolley.

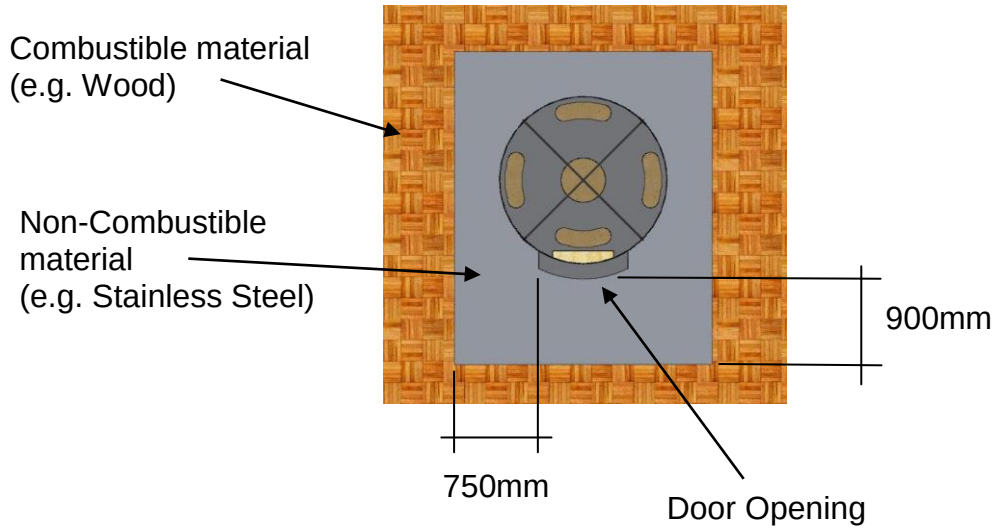
If there are stairs, there must be sufficient width to install the 'A' frame to move the halves up the stairs. If there are too many stairs or the corridor has corners that are too sharp, or the opening is narrower than 700mm, the oven cannot be installed without modifications to the building. **Seek special advice from Beech Ovens Technical Support.** technical@beechovens.com.au

Investigation must be made to ensure that the floor both where the oven is to be transported upon and the floor under where the oven shall be installed are sufficient to support the oven.

Protection of Combustible floors

All Beech Ovens must be installed upon non-combustible material. The minimum hearth extension areas to be covered with non-combustible material in relation to the door opening of the oven shall cover at least the following areas:

- 750 mm to each side of the door opening.
- 900 mm in front of the door opening.

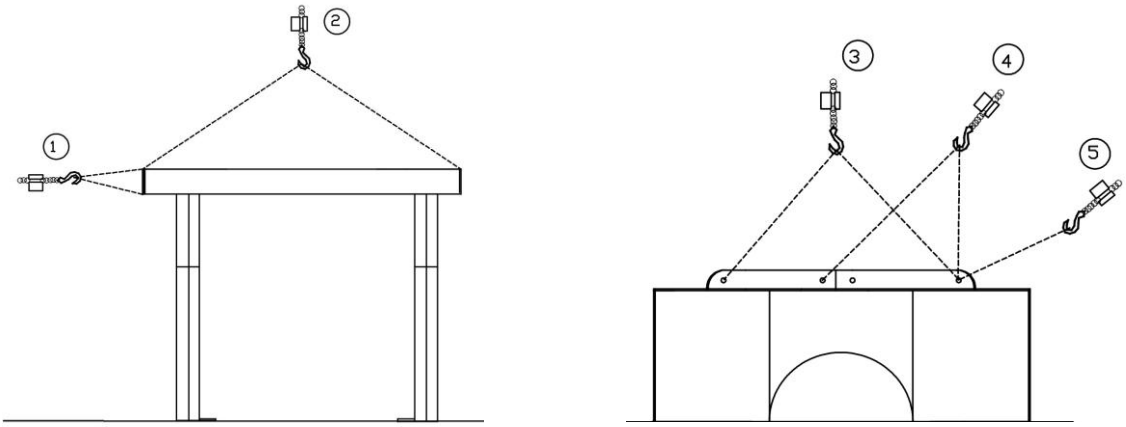


If you have an ash disposal container it must also be placed on non-combustible material, have legs to raise it from floor contact and have a tight-fitting lid.

Oven Installation Procedure

Prior to installing the oven, visit the installation area and determine if there are doorways narrower than the oven in an upright *(normal)* position. If there are no narrow doorways, the oven can be kept in the horizontal plane i.e. not tilted on its side to go through doorways. The oven has been designed to fit through any standard doorway on its side and to fit in most standard elevators which are capable of the weight.

Lifting Positions



The above diagrams show the positions in which to lift the Base and Upper sections of the Oven depending on access to the final installation position.

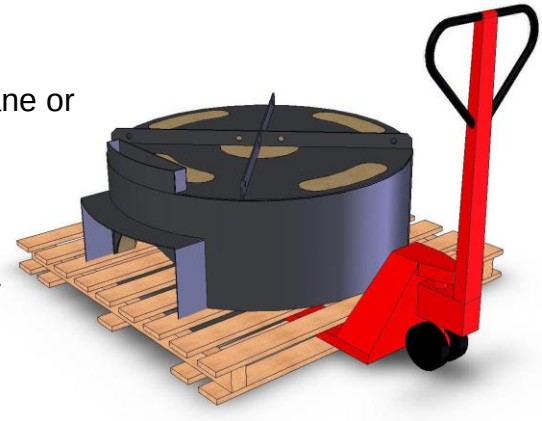
1. Lift here if the Oven Base is to be placed on pallet trolley on its side.
2. Lift here if the Oven Base is to be placed flat onto pallet trolley *(pallet).*
3. Lift here if the Upper section is to be placed flat onto pallet trolley *(pallet).*
4. Lift here if the Upper section is to be placed flat after having been transported on its side.
5. Lift here if the Upper section is to be placed on its side to navigate narrow passageways.

NOTE: *Installation is to be carried out using suitable lifting equipment with sufficient load capacity to suit the Oven weight. E.g. Hotel crane, mobile crane, strapping, hooks, etc. Take care when lifting these sections.*

Transportation

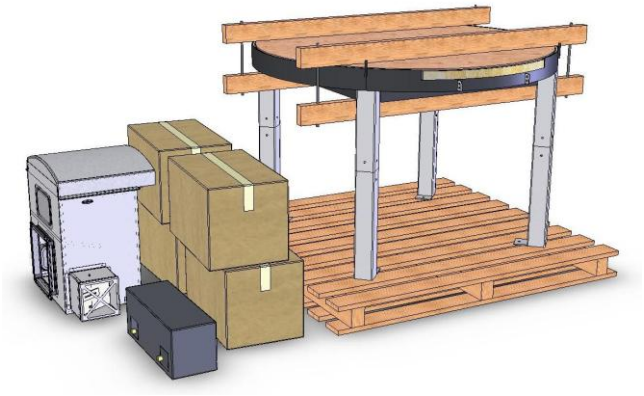
Take the Oven to the site.

Lift the Upper section from truck using hotel crane or mobile crane of sufficient capacity.

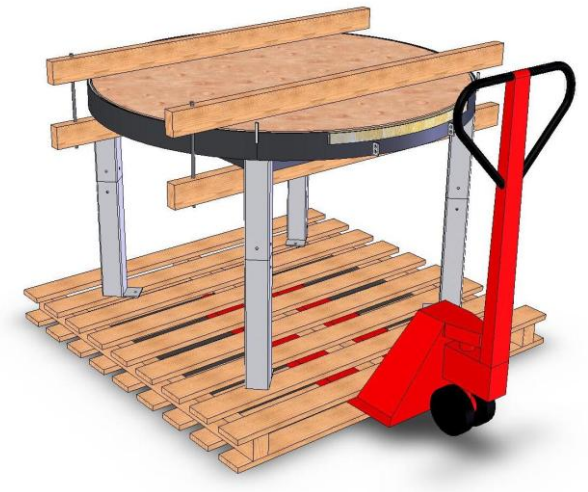


Move the Upper section to kitchen. *(Remove from pallet and place on it's side on pallet trolley if it must go through narrow doorways - See previous section -* ***Lifting Positions****)*

Lift the Base section from truck using hotel crane or mobile crane of sufficient capacity. *(Remove from pallet and place on its side on pallet trolley if it must go through narrow doorways - See previous section -* ***Lifting Positions****)*
Do NOT remove plywood from top of Base.



Carefully remove the equipment stored beneath the Base and store in a secure location (ready for later assembly).



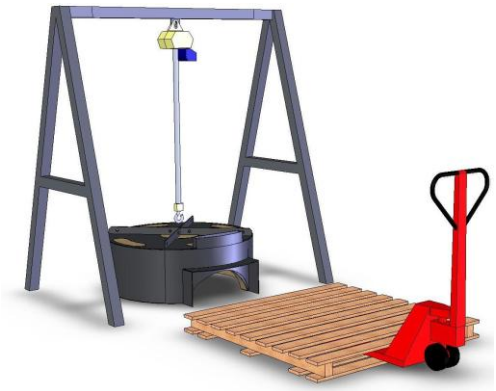
Now lift the Base onto pallet trolley. *(On i's side if it must go through narrow doorways: See previous section -* ***Lifting Positions****) Remove legs from oven base to reduce its width if necessary.*

Carefully move this section of oven to location *(re-attach legs firmly with supplied bolts if transported on its side).*

Assembly

The procedure mentioned below uses an “A-Frame” lifting method for assembling the oven. Other lifting methods may be used e.g. a fork truck or crane, however the following principals still apply.

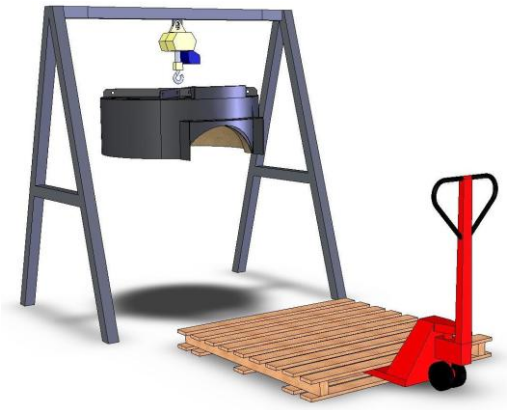
Assemble lifting frame in kitchen where space permits. *(The assembled oven must be able to be moved within the kitchen area without obstruction later on the trolley.)*



Utilizing lifting point 3 on previous diagram, lift the top free of the pallet and place on the ground, whilst moving the base into position.

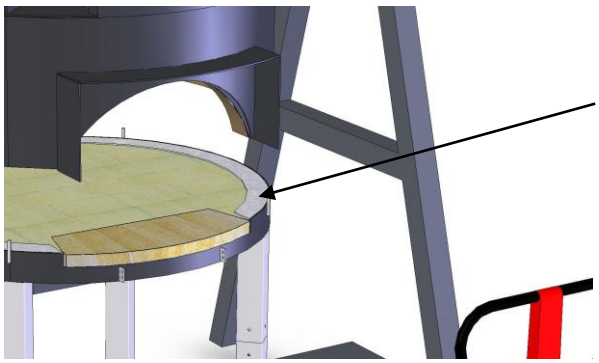
Lift the oven top to such a height to leave a clear space underneath of minimum **1150mm** to enable the base of the oven to fit under oven top.

(Lift the base of the oven to a horizontal position and fit legs if previously removed.)



Move base under elevated top section using a lifting frame or a stack of narrow pallets, **being careful not to damage any equipment under the oven; e.g. burners, sensors, etc.**

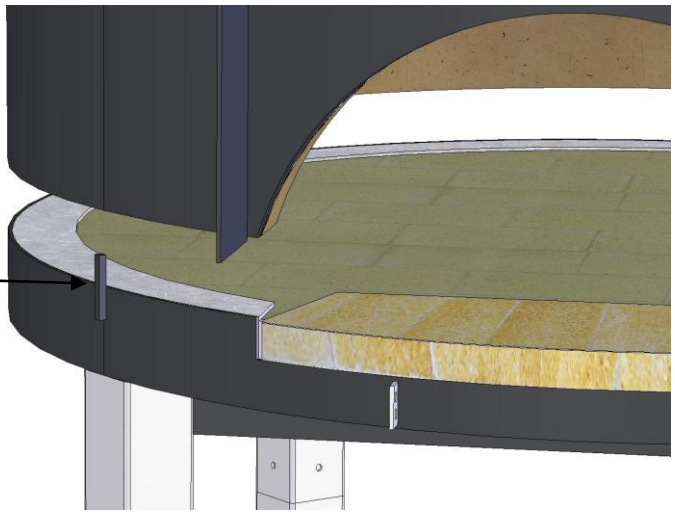
You may now remove the protective plywood from the top of the base.

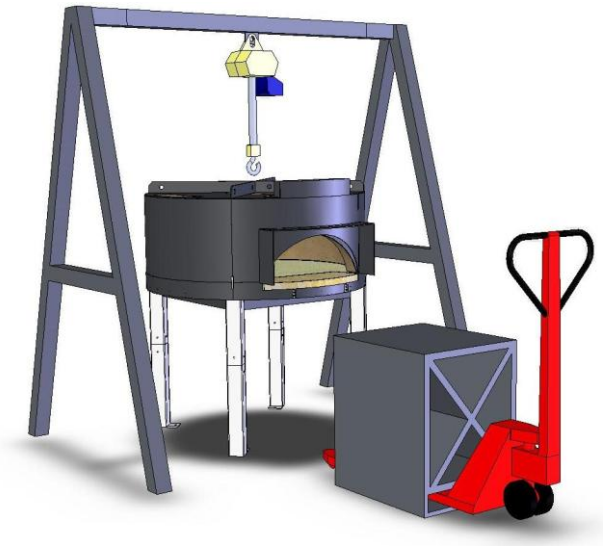


Place strips of 60mm x 13mm ceramic insulation wool *(supplied)* beneath the top of the oven where the top section touches the base.
NOTE: No wool should come between the steel of the top and base.

Position wool strips so that they remain hidden when the two halves of the oven are assembled together.

Align the top and base using the positioning tabs welded to the base, locating the rear tab first. **Ensure that the oven mouth aligns with the cut-outs in the base.**





With the two halves together the oven is now ready to have the supplied 50mm ceramic insulation wool fitted to the external surfaces.

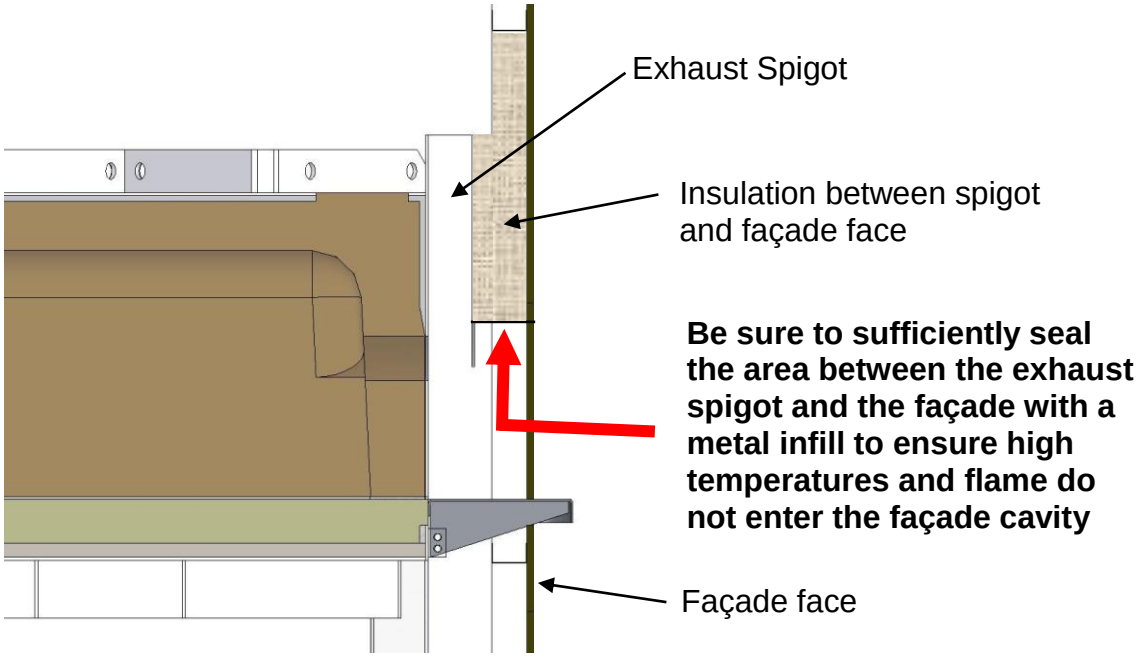
The “A-frame” can now be dismantled and removed.

The external surfaces *(sides and top)* of the oven are then completely covered with ceramic insulation wool (*50mm Superwool*) using the high temperature “Kaogrip” glue provided.

First cut all pieces required to cover the sides and top using a sharp knife. These should fit closely up to each other with no visible gaps to allow heat to escape.

When all pieces are cut, place each piece on the floor and, one at a time, apply a generous coat of “Kaogrip” glue to the wool as shown using a trowel or similar application tool.

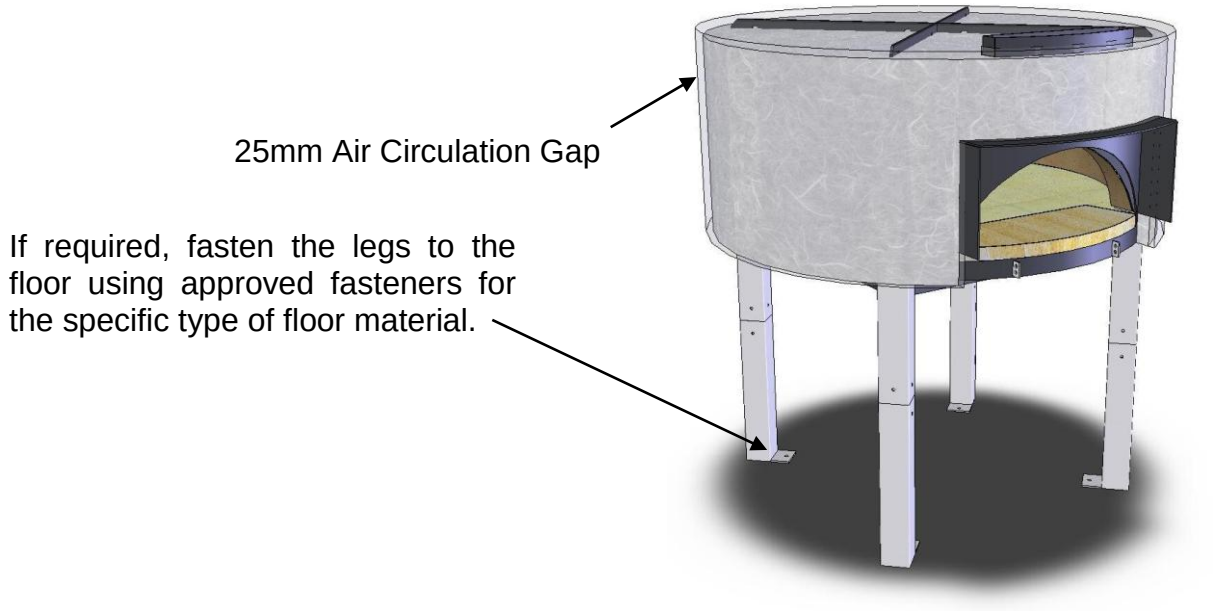
An important area to be aware of is directly in front of the exhaust spigot of the oven. If the façade protrudes from the spigot there may be an area between the spigot and the façade which is left uncovered and vulnerable to soot and grease build up. This area is commonly overlooked when constructing the oven façade and if not sufficiently sealed creates a **fire hazard**.


Exhaust Spigot
Insulation between spigot and façade face
Be sure to sufficiently seal the area between the exhaust spigot and the façade with a metal infill to ensure high temperatures and flame do not enter the façade cavity
Façade face

When fitting the ceramic insulation wool to the oven, be sure that the wool is firmly in place and that all air pockets are removed. The glue will dry in approximately one (1) hour depending on ambient conditions.

The oven is now ready to be moved carefully and exactly into its final position, using the lifting frame and a pallet trolley *(or similar).*

Using a spirit level or similar, ensure that the oven floor is level.

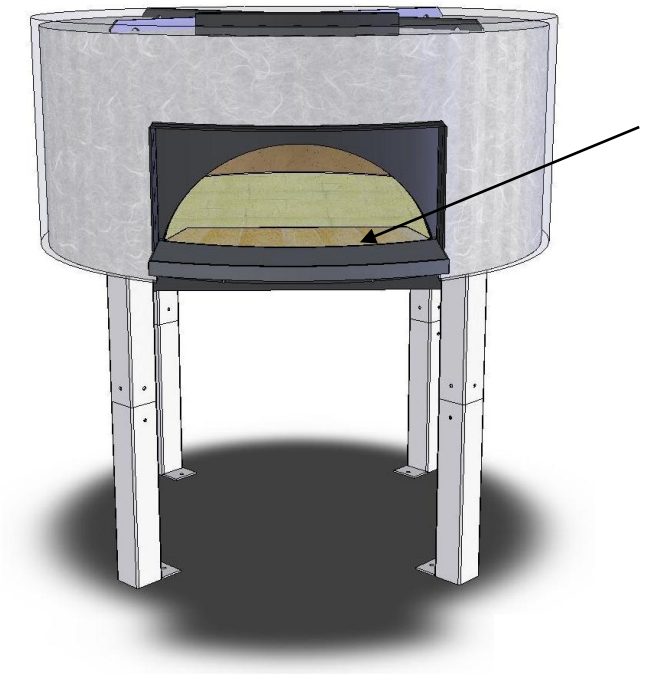

25mm Air Circulation Gap
If required, fasten the legs to the floor using approved fasteners for the specific type of floor material.

NOTE: Fully assembled the oven can be extremely heavy. Be sure to use suitable lifting equipment when moving to final position.

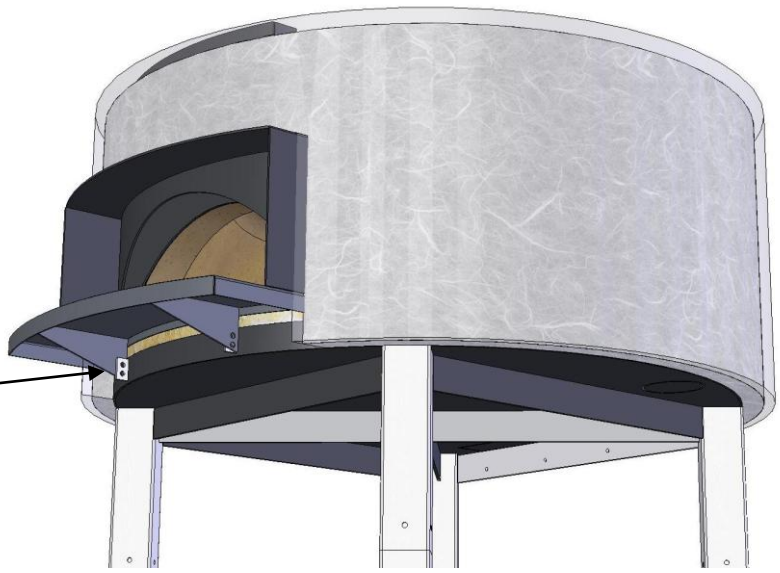
NOTE: *A 25mm **Air Circulation Gap** is to be left between the ceramic wool and any surface surrounding the oven after final installation. Failure to leave this air gap will result in above normal temperatures being transferred to exterior surfaces, causing a **fire hazard**.*

Stainless Steel Hearth

When fitting the Stainless Steel Hearth (SSH), be sure that the top of the hearth is level with the top of the floor bricks. Should the hearth be fitted too low, the floor bricks may be damaged when using the oven. If adjustment is required, loosen the bolts used to mount the SSH to the mounting tabs. Ensure these are tightened well when the hearth is in its final position.



Ensure that the Stainless Steel Hearth (SSH) is level with the top of the floor bricks

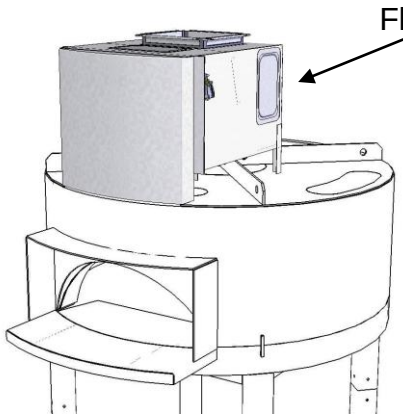


Mounting tabs for the SSH. *(Loose fitting bolts allow for slight adjustment)*

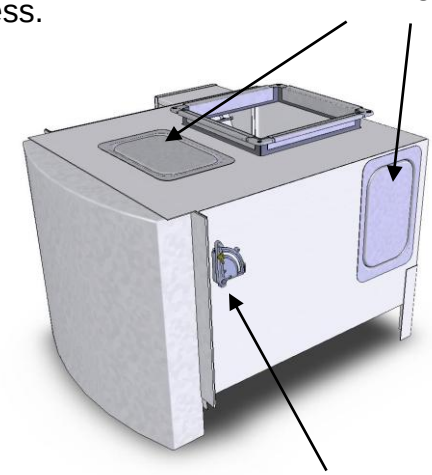
Flue Connection

Most Beech Ovens are supplied with either a Flue Transition or a Spray Filter. The main function of the Flue Transition is to form a transition from the oven spigot to a standard commercial flue duct connection point directly above the oven. The Spray Filter has the same properties as the Flue Transition though it has the added feature of a fine mist spray to remove particulate and dampen embers expelled from the oven. Both systems have an integrated System Damper and two (2) inspection/ cleaning ports.
Both systems are of similar dimension though distinctively different.

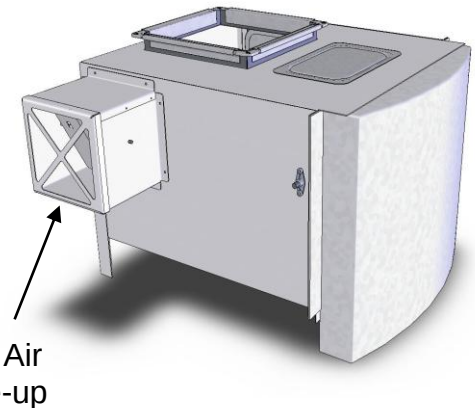
Flue Transition



Each unit is fitted with two (2) inspection/ cleaning ports to allow for easy access.



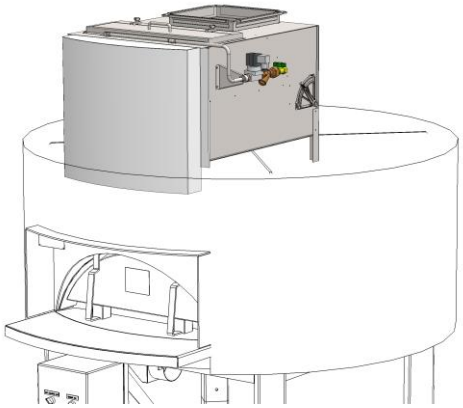
The System Damper is designed to regulate the amount of air allowed to be drawn from the oven to achieve a correct operational balance.



The Cool Air make-up system (Barometric Controller) is a factory set, balanced exhaust dilution device designed to, automatically regulate the amount of cool air required to maintain an acceptable flue gas temperature.

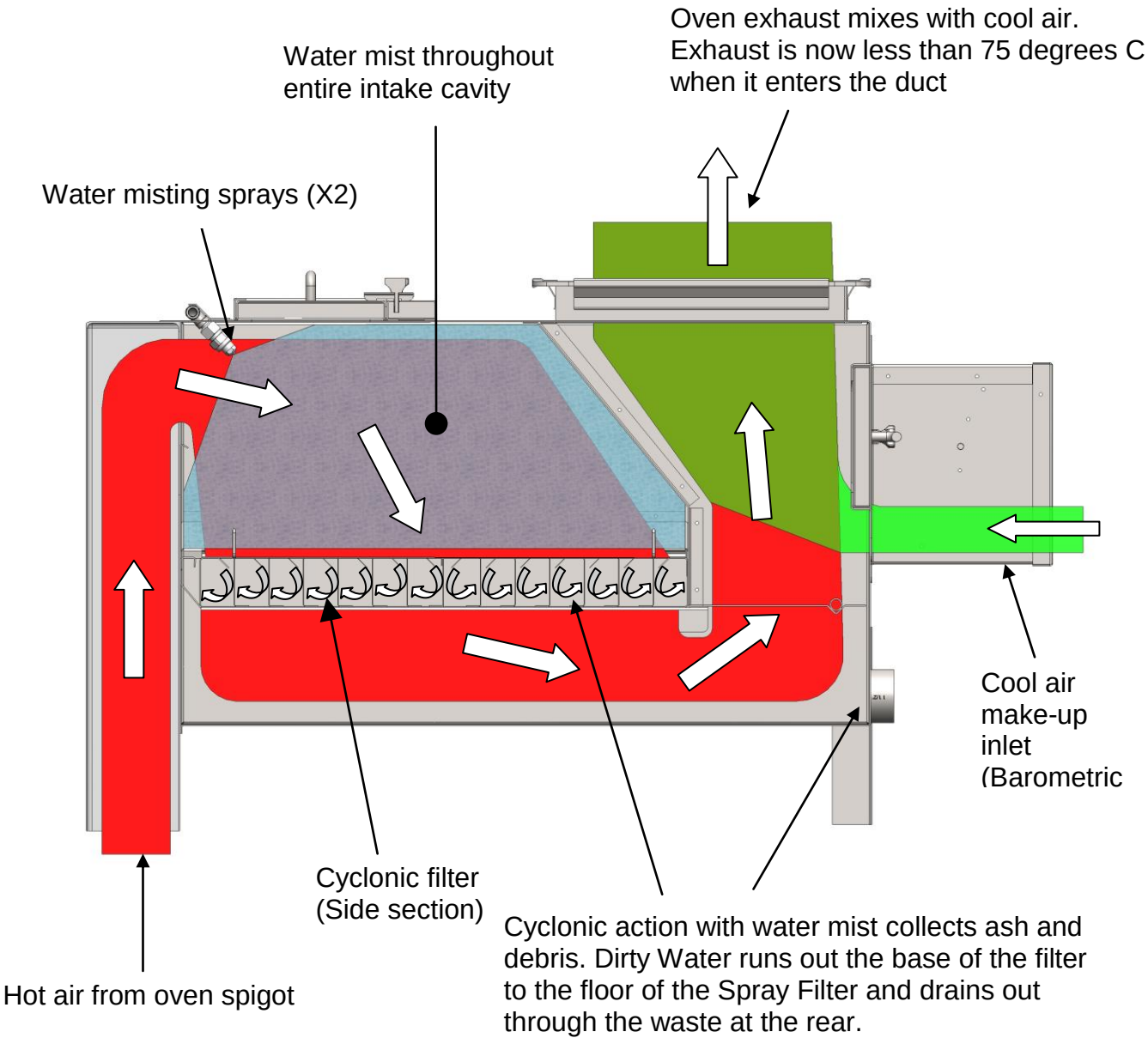
(Wherever possible, it is recommended that cool air from an outside environment be connected to the cool air make-up device. Consult your mechanical service consultant to design connection.)

Spray Filter



The improved Spray Filter, released into production in August 2010, includes a removable cyclonic filter. The cyclonic filter is permanently washed with a water misting spray which is designed to adhere to particulate such as soot, ash and grease and contain it in the waste water, which is then drained away.

The basic function is outlined below.


Oven exhaust mixes with cool air. Exhaust is now less than 75 degrees C when it enters the duct
Water mist throughout entire intake cavity
Water misting sprays (X2)
Cool air make-up inlet (Barometric
Cyclonic filter (Side section)
Cyclonic action with water mist collects ash and debris. Dirty Water runs out the base of the filter to the floor of the Spray Filter and drains out through the waste at the rear.
Hot air from oven spigot

Spray Filter - Technical Specifications

Water Usage
@ 1.5 bar – 11.2l/Hr X 2 = 22.4l/Hr Total
@ 3 bar – 15.8l/Hr x 2 = 31.6l/Hr Total

Air Flow Volume
1 Door Oven = 700 litres/sec (2520m3/Hr)
2+ Door Oven = 1000 litres/sec (3600m3/Hr)

Cool Air Make-up
Ensure a fresh air supply is available. If the area above the oven is NOT well ventilated, the cool air inlet should be connected to a fresh (*cool*) air supply *(outside air recommended)*

Exhaust Connection
300mm x 300mm standard duct flange. *(See above for required Air flow volumes)*
½" BSP (15mm ID) fitting connected to the shut off valve fitted to Spray Filter.

Water Connection
Minimum flow rate = 1.5 bar
Maximum flow rate = 6 bar *(greater than 3 bar is less effective and noisy)*

Electrical Connection
240VAC Single Phase - 10Amp

The solenoid should be interlocked with the exhaust fan: When the exhaust fan is on, the solenoid is open and water can flow - when the exhaust fan is turned off the solenoid should close.

NOTE: *The solenoid should ALWAYS be activated (open) whenever the oven is hot – this includes approx 3 hours after shut down.*

Waste Water Connection
1½" BSP fitting connected to rear of spray filter with 40mm *(or equivalent)* copper pipe to be plumbed to the kitchen waste via a clearly visible tundish.

(The tundish should be clearly visible so that the operator can see that water is flowing through the spray filter and it is operational)

NOTE: *Do NOT use plastic or PVC pipe as the waste water can be warm/hot and melt the plastic.*

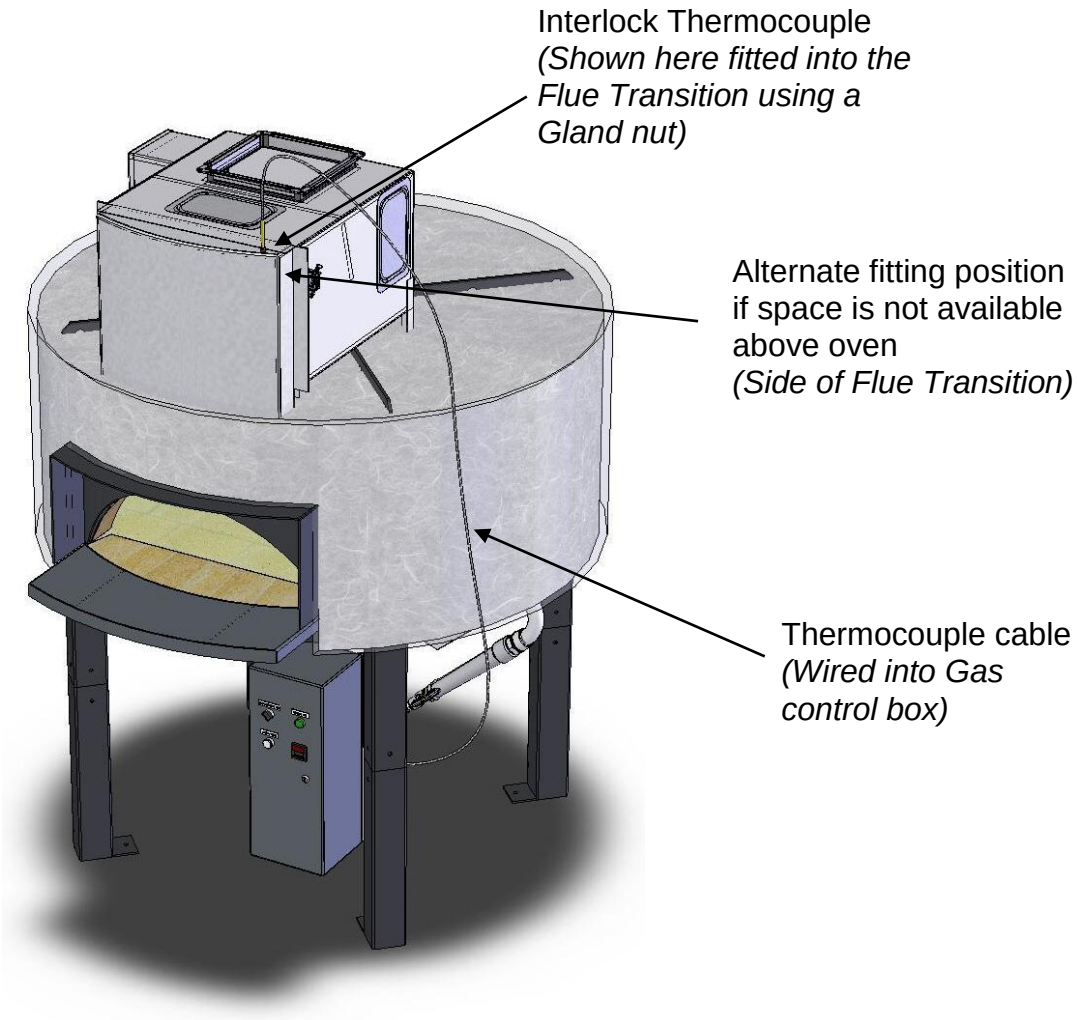
See **System Connection** section for connection locations.

Interlock System - Australian markets ONLY.

For all Gas fired Oven installations within Australia, there is a requirement by the Australian Gas Association *(AGA)* for the Gas system of your Beech Oven to comply with the Gas Installation Standard AS5601.

To meet this requirement, all Gas fired Beech Ovens are required to be fitted with a “Power flue” system of exhaust extraction. This is to safeguard against spillage of combustion product gases into the kitchen area. In line with this requirement, it is required that the Gas system of the oven is interlocked with the performance of the Flue. If the flue performance deteriorates *(so that spillage may occur)* the Gas system should shut off and “lock-out” in such a manner that to re-start the Gas system, the operator must manually reset the system. *(This will give warning to the operator that there may be a problem with the “Power Flue.”)*

To reset the system, turn the Main Control switch on the front of the Gas control cabinet to **OFF,** then **ON** again.


Interlock Thermocouple
(Shown here fitted into the Flue Transition using a Gland nut)
Alternate fitting position if space is not available above oven
(Side of Flue Transition)
Thermocouple cable
(Wired into Gas control box)

Beech Ovens supply a flue performance monitoring system that will fulfil the requirement of this Standard. The system consists of an Interlock Thermocouple, a mounting gland nut and a temperature controller, most of which are assembled into the Gas control cabinet. The operation of this system is to monitor the temperature of the exhaust gas at the top of the flue spigot above the oven mouth.

During normal operation with the flue fan operating, this area of the exhaust is around 120-170°C. This temperature is caused by a mixture of hot gases from the oven and cool gases *(air),* from the area in front of the oven, being draw together into the exhaust spigot.

Should the power for the system fail or deteriorate to an extent where there may be spillage of combustion product from the oven, the amount of cool air from the kitchen area being drawn into the flue spigot will decrease and the temperature in this spigot area will rapidly increase.

The interlock temperature controller is preset to 200°C. When this temperature is found in the flue spigot by the thermocouple probe, the system controller will interrupt the power supply to the main oven gas system. This will in effect turn off the gas to the oven burners.

The gas system will automatically relight and resume its pre-programmed operation when the main control switch on the front of the Gas control cabinet has been reset. *(Turn **OFF** and turn **ON.***) Before this is done, to stop repeated cut-outs, the flue system should be inspected to verify correct operation. *(Refer to **System Damper Calibration** in this Manual.)*

The before mentioned 200°C limit is used, as this temperature is quickly achieved even when the oven is started from cold and the fan has not been switched on. *(In testing, the Gas system will turn off in less than 2 minutes if this situation occurs)*
Once the oven is hot, this interruption time is much less. 200°C is also a good flue temperature to avoid because of the ability for spontaneous combustion to occur at temperatures above this value.

The only additional work required outside of normal installation, is to fit the Interlock Thermocouple probe to the Flue Transition (Adapter) above the oven mouth as illustrated on the previous page.

NOTE: *When coiling the cable to the Thermocouple, be sure not to kink or damage the cable. The cable is to be routed in a tidy manner using the supplied clips and cable ties under the oven base ensuring that it is not attached to other cables, metallic or sharp objects.*

Water Flow Sensor - UK market ONLY

For those ovens supplied to the United Kingdom with a Spray Filter, a Water Flow Sensor is fitted to safeguard that the water supply to the spray filter is on and constant. This device is fitted into the water inlet assembly and the electrical cable from the flow switch should be connected to the dedicated plug on the back of the gas control cabinet.

Because the water inlet solenoid should be connected to the exhaust fan *(when the exhaust fan is on the solenoid should be on/open)* when the oven is switched on, the flow switch should be activate which allows the oven to proceed to normal use.

In the event that the water supply is interrupted due to any of the following, the sensor will close and the Gas supply to the oven will be stopped.

- exhaust fan failing
- exhaust fan being switched off *(or not switched on)*
- water supply is interrupted *(or not turned on)*
- spraying nozzles are blocked
- in line mesh water filter is blocked

When the water supply has been restored, the system will then need to be manually reset, by turning the main control switch to **OFF,** and then **ON** again. If the water supply is no longer interrupted, the gas will not turn on again and the system will function normally.

To test the system is working correctly, shut off the water supply to the spray filter. The Gas system should shut down.

Should the sensor be faulty, replace and test before commencing normal oven operation.

Exhaust Duct Design

The following section is for your guidance in establishing a design to suit your Exhaust duct design requirements.

Exhaust ductwork should be carried out by a qualified, experienced trade team with knowledge of local authority requirements. The following information is supplied **ONLY** as a guide.

NOTE: *The temperature of the oven is dependent on the size of the fire and the* ***volume of airflow to the exhaust duct****. The 'exhaust flow' is controlled by the system damper and the fan capacity.*

Access to the system damper is required for initial adjustment, for cleaning and maintenance and for further adjustment should ambient conditions change.

Flue Material

Check your local authority requirements.

Also available and highly recommended are a variety of specialised proprietary flue systems including stainless steel twin and triple skinned products. *(Your local mechanical contractor should advise you of available systems.)*

Recommended Flue size

300mm square or equivalent cross-sectional area in round or rectangular section. For ducted systems more than 6 metres long or containing more than 4 bends, professional ducting advice should be obtained.

Nominal airflow required (at Flue Connection)

130Pa Static Pressure
Maximum total flue airflow - 700 litres / second for a single opening.
Maximum total flue airflow - 1000 litres / second for multi-door ovens.

The oven flue can be connected to any exhaust system with a much higher flow rate by controlling the suction utilising a damper.

Methods of Exhaust ducting

The exhaust system is an integral part of the oven's safe and reliable operation. It is strongly recommended that all exhaust ductwork be carried out using a qualified and experienced trade team with knowledge of local authority requirements. All ductwork will require access for cleaning and require regular maintenance.

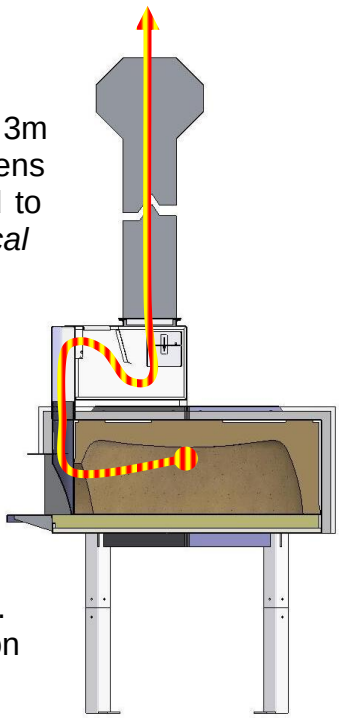
The following methods are to be used ONLY as a guide.

There are typically five (5) methods of exhaust ductwork for a Beech Oven. These methods are using:

- **Natural Draft –** Dedicated system
- an **Exhaust Fan –** Dedicated system
- an **Existing Exhaust System** – Shared system
- a **Spray Filter**
- **Canopy method -** Preferred

Method 1 – Natural Draft

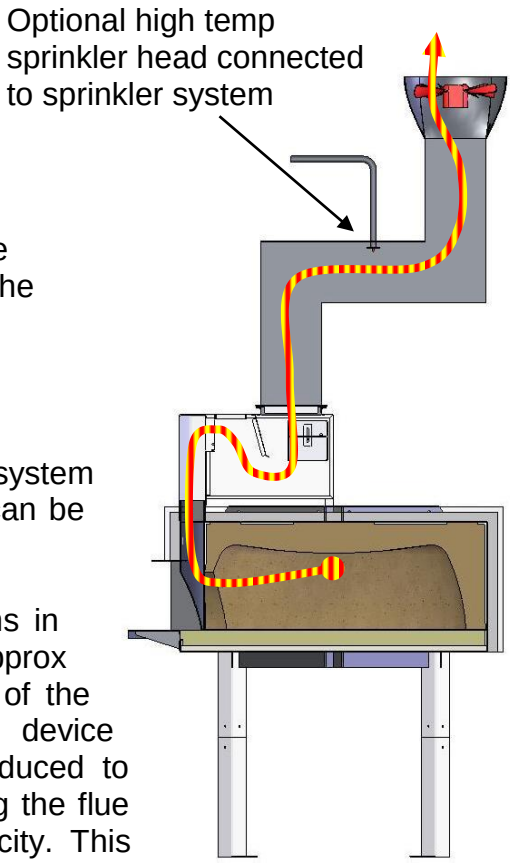
Dedicated flue less than 15m in length with less than 3m horizontal. Normally this system is used for Wood Only ovens though if used with Gas, a special test should be performed to ensure that no spillage occurs. *Contact Beech Ovens Technical Support for more information.* technical@beechovens.com.au



Flue size 300mm x 300mm or equivalent (internal dimension). The integrated system damper is designed to control the draft. Access to the system damper is required to allow small adjustments for varying conditions *(In some instances a fan may need to be fitted later if natural draft does not work effectively or reliably.)* Use of a weatherproof vertical discharge capable of minimizing the effect of wind is recommended. Allow access to duct for periodic cleaning. Refer to local regulations for discharge and installation requirements.

NOTE: *Because of the residual build-up in the flue, it is highly recommended that the flue be inspected after three (3) months and a cleaning schedule be implemented as required.*
Failure to properly maintain the flue, may result in flue failure and potential fire hazard.

Method 2 – Use of Exhaust Fan



Dedicated oven system.

Flue size 300mm x 300mm or equivalent *(internal dimension).*

For ovens that will be using wood fuel, we recommend the use of a dedicated flue for the oven connecting to a dedicated fan.

There are two methods of fan extraction,

(A) Low volume extraction. This is a very hot system and is **NOT** recommended. As low as 150l/s can be drawn through the system.

(B) High volume extraction. Extraction systems in excess of 700l/s can be set up to extract approx 150l/s per door from the oven. With the use of the system damper and the cool air make-up device *(Barometric Controller),* cool air can be introduced to add additional safety to the system by lowering the flue temperature and increasing the flue gas velocity. This helps to keep the system clean and efficient.

(Wherever possible, it is recommended that cool air from an outside environment be connected to the cool air make-up device. Consult your mechanical service consultant to design connection.)

Method 3 – Use of Existing System

In some instances it is possible to connect the oven exhaust to an established kitchen exhaust duct. These are generally available in kitchens that have canopy systems in place for other appliances. Professional advice should be sought to ascertain the compatibility of the existing system to accept the additional load of the oven system inclusion.

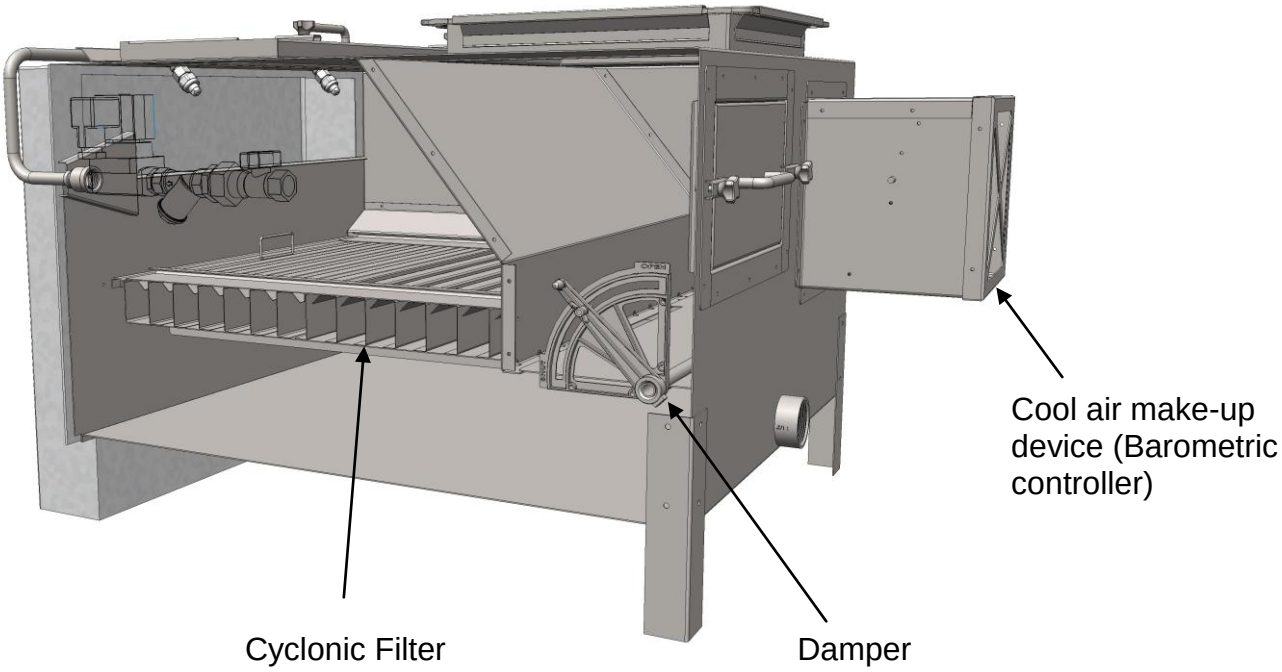
It must also be acceptable to local certifying engineers.

We strongly recommend the inclusion of a Spray Filter in these instances to reduce the possibility of fire from excessive temperature or from spark ignition of flue debris.

Method 4 – Use of a Beech Ovens Spray Filter

Beech Ovens have developed a system to treat all oven exhausts with a water misting spray and cyclonic filter operation. Included in the system is a “cool air make-up device” *(barometric controller),* which further dilutes the exhaust to a much lower temperature.

The misting spray is effective in treating the 150l/s *(or up to 450l/s for multi door ovens)* of oven exhaust.



The inclusion of the cool air make-up *(700 to 1500 l/s)* can drop the temperature to between 35°C and 100°C.

Services required for this system are extensively outlined in **Spray Filter – Technical Specification** in this manual.

This spray filter system is applicable to all *(and only)* fan driven systems.

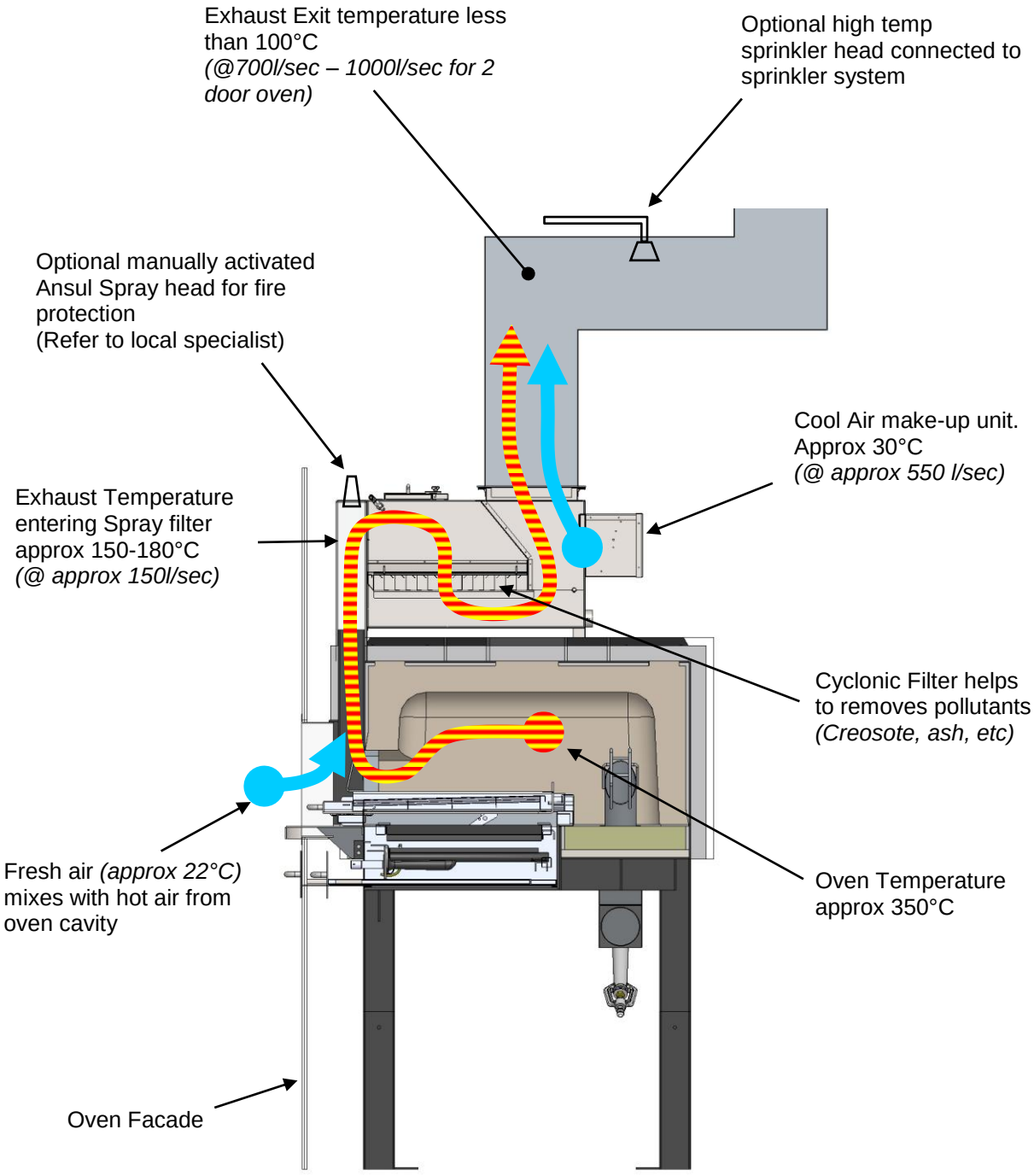
For further information, see **Spray Filter** section earlier in this manual.

Spray Filter normal operating Temperatures and Air flow volumes

The diagram below identifies the normal operating temperatures for the Spray filter System.

NOTE: Normal operating temperatures should be under 100°C. This will rapidly increase due to the following; Fan failure, Power Failure and/or Mechanical Ventilation Failure.

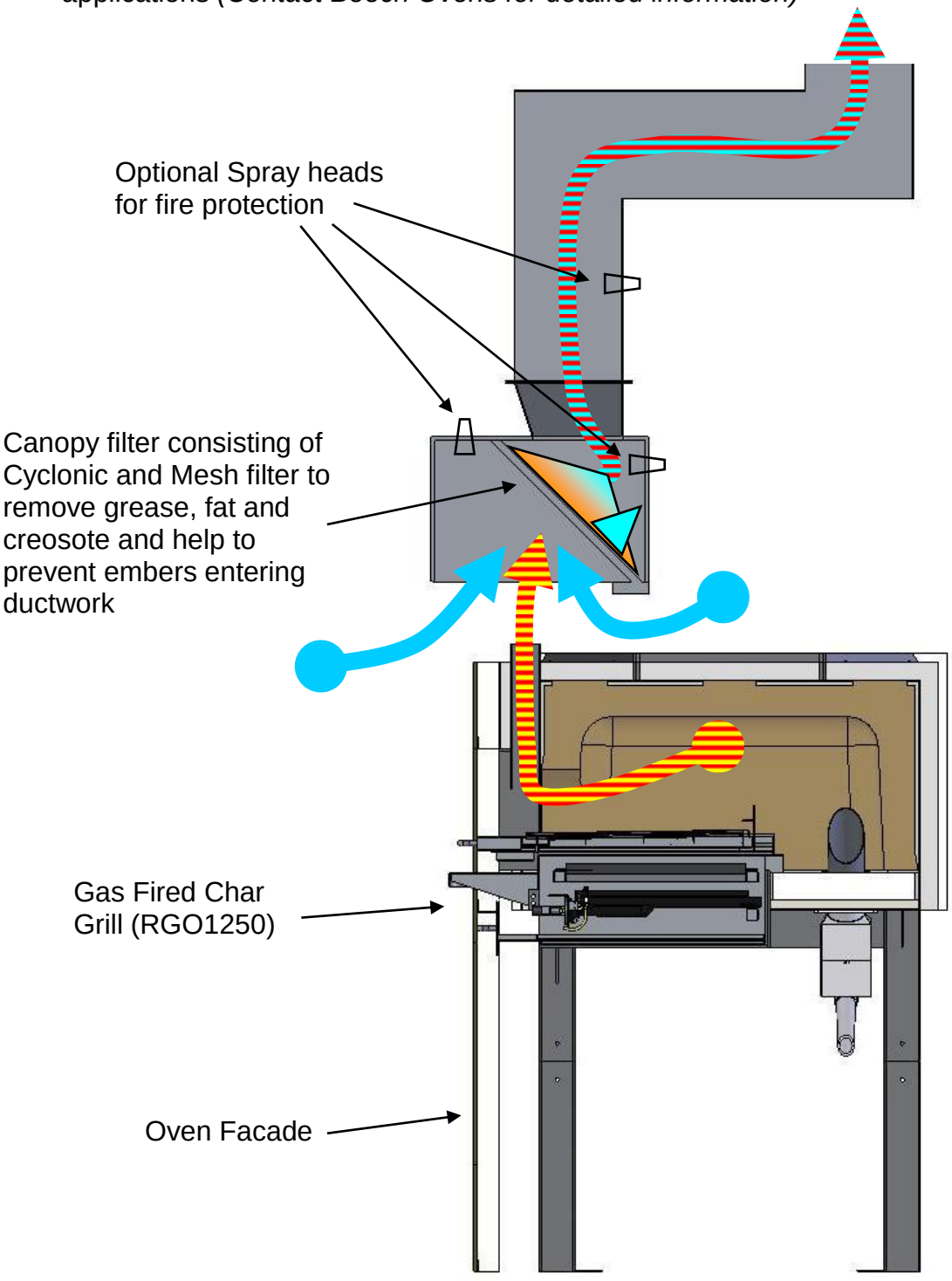
If an Ansul system is required, we recommend a single head at top of the exhaust spigot which should be manually activated by the oven operator.

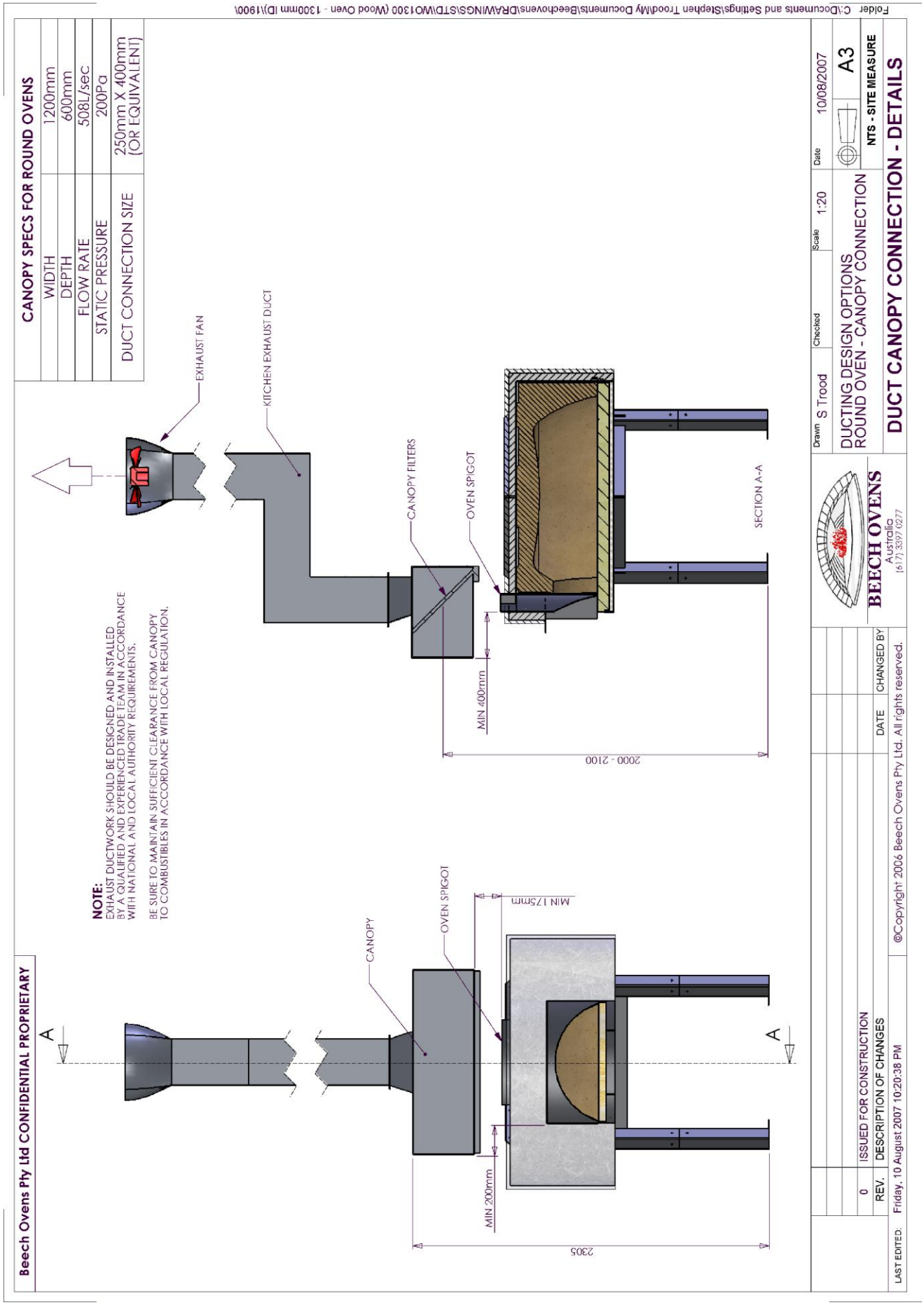

Exhaust Exit temperature less than 100°C
(@700l/sec – 1000l/sec for 2 door oven)
Optional high temp sprinkler head connected to sprinkler system
Optional manually activated Ansul Spray head for fire protection
(Refer to local specialist)
Cool Air make-up unit.
Approx 30°C
(@ approx 550 l/sec)
Exhaust Temperature entering Spray filter approx 150-180°C
(@ approx 150l/sec)
Cyclonic Filter helps to removes pollutants
(Creosote, ash, etc)
Fresh air *(approx 22°C)* mixes with hot air from oven cavity
Oven Temperature approx 350°C
Oven Facade

Method 5 – Canopy Method

The installation of a canopy has several benefits. These are;

1. Easy access to filters for regular cleaning
2. Visible break between spigot and canopy to alert if flash fire should occur
3. Better access to oven spigot to allow for regular cleaning
4. Allowance for Spray heads to be fitted for fire protection
5. Options such as an Automatic Water Wash and Misting Spray System for high use applications *(Contact Beech Ovens for detailed information)*


Optional Spray heads for fire protection
Canopy filter consisting of Cyclonic and Mesh filter to remove grease, fat and creosote and help to prevent embers entering ductwork
Gas Fired Char Grill (RGO1250)
Oven Facade


CANOPY SPECS FOR ROUND OVENS
WIDTH 1200mm
DEPTH 600mm
FLOW RATE 508L/sec
STATIC PRESSURE 200Pa
DUCT CONNECTION SIZE 250mm X 400mm (OR EQUIVALENT)
EXHAUST FAN
KITCHEN EXHAUST DUCT
CANOPY FILTERS
OVEN SPIGOT
SECTION A-A
MIN 400mm
2000 - 2100
NOTE:
EXHAUST DUCTWORK SHOULD BE DESIGNED AND INSTALLED BY A QUALIFIED AND EXPERIENCED TRADE TEAM IN ACCORDANCE WITH NATIONAL AND LOCAL AUTHORITY REQUIREMENTS.
BE SURE TO MAINTAIN SUFFICIENT CLEARANCE FROM CANOPY TO COMBUSTIBLES IN ACCORDANCE WITH LOCAL REGULATION.
CANOPY
OVEN SPIGOT
MIN 175mm
MIN 200mm
2305
A
A
Beech Ovens Pty Ltd CONFIDENTIAL PROPRIETARY
Folder C:\Documents and Settings\Stephen Trood\My Documents\Beechovens\DRAWINGS\STD\WO1300 (Wood Oven - 1300mm ID)\1900\
Drawn S Trood
Checked
Scale 1:20
Date 10/08/2007
A3
DUCTING DESIGN OPTIONS
ROUND OVEN - CANOPY CONNECTION
NTS - SITE MEASURE
DUCT CANOPY CONNECTION - DETAILS
BEECH OVENS
Australia
(61) 3397 0277
REV. DESCRIPTION OF CHANGES DATE CHANGED BY
0 ISSUED FOR CONSTRUCTION
LAST EDITED: Friday, 10 August 2007 10:20:38 PM
©Copyright 2006 Beech Ovens Pty Ltd. All rights reserved.

General Information on Flues

Due to the nature of wood fired ovens, the exhaust temperatures can be quite high and sparks or embers may be present *(hence fire danger should be considered.)*
To avoid problems there are a number of options to be considered:

- **It is always important to keep the flue system clean.**
- When firing the oven with wood, we strongly recommend the use of good, clean hardwood fuel only.
- **A build-up of soot and/or creosote in the flue is not good in any situation. We recommend inspections every three months. Through these regular inspections you can develop a program for regular cleaning of your system.**

Flue Fires

To reduce the possibility of flue fire we recommend the following steps.

1. **Keep the flue system clean. This includes the oven spigot *(prior to the Spray Filter if fitted)* and all ductwork. Introduce regular inspections to develop a program for regular cleaning of your system.**

2. For solid fuel ovens it is recommended they be connected to a dedicated exhaust extraction system.

3. To further reduce the risk of fire, a high temperature sprinkler head can be installed into the duct, connected to a constant/ secure water supply. This can be included on any flue system. Contact your local fire safety consultant for more information.

4. Where possible, if connecting to a communal kitchen extraction system, connect oven to ducting from the dishwasher canopy.

5. For additional safety, use a Beech Oven Spray Filter.

6. Cool air from the ceiling void, restaurant or ideally from outside the building can be introduced into the Cool Air make-up inlet.

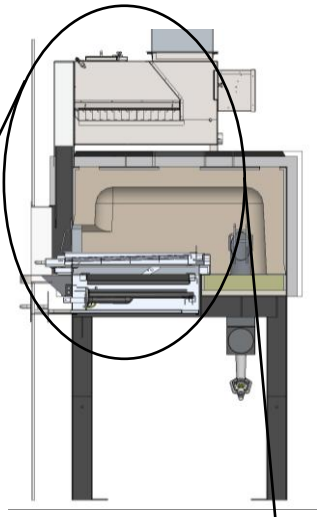
7. Where possible, install the oven under a recommended canopy exhaust system.

Possible cause of Flue fire

Flue fires are primarily due to poor maintenance and the lack of a rigid cleaning schedule. Most flue fires can be prevented by implementing a regular and thorough maintenance schedule as outlined in the Maintenance section of the Installation and Operation Manual.

The illustration below outlines the possible cause of a flue fire and highlights the most vulnerable area which requires regular cleaning and maintenance.

Although all Spray Filters supplied from July 2010 are designed to prevent the spread of fire past the cyclonic filter, this should not be assumed to be a fire blocking mechanism. Fire prevention by regular maintenance and cleaning is always best practise.

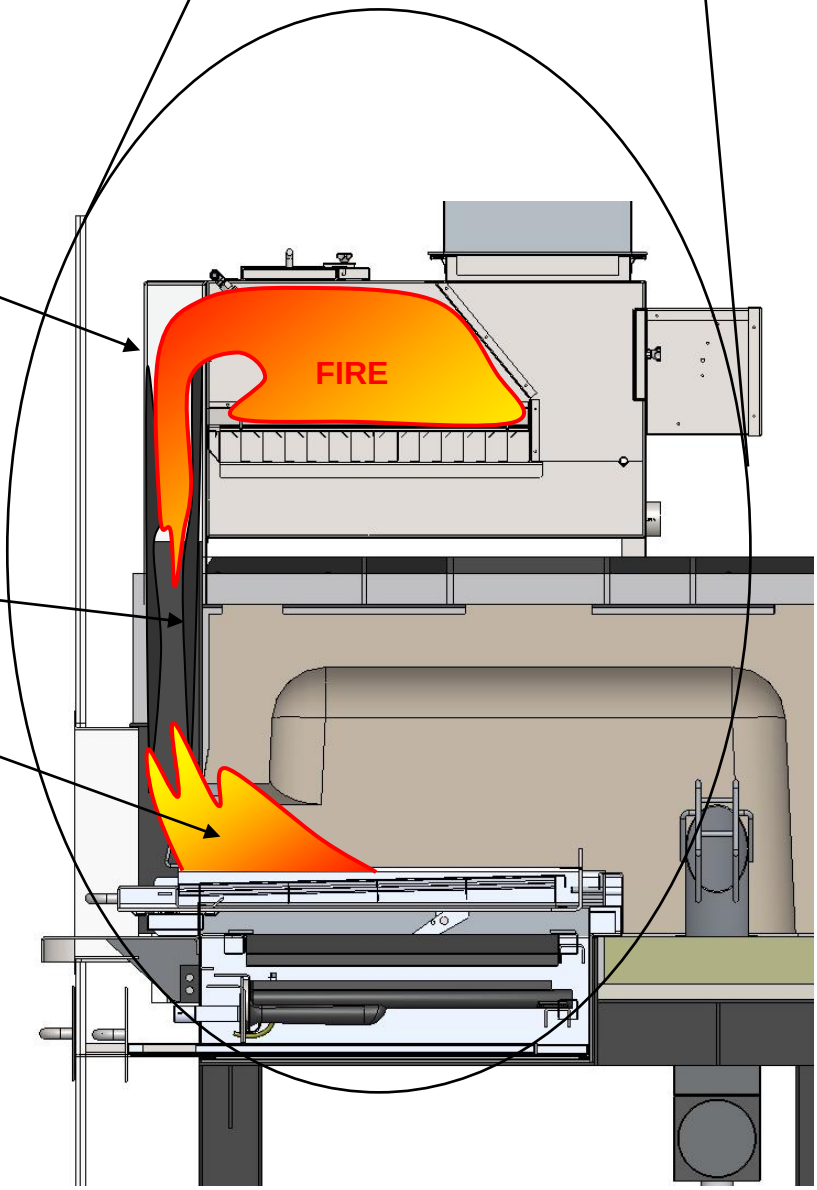


2. The fire, fuelled by a residual build up of grease, fat and creosote, is drawn into the Spray filter.

REGULAR DUCT MAINTENANCE IS ESSENTIAL. WE RECOMMEND A 3 MONTHLY MAINTENANCE SCHEDULE.

1. Grease build up on spigot walls ignites from flash fire on Char Grill

THE SPIGOT WALLS MUST BE CLEANED DAILY OR WEEKLY DEPENDING ON THE GREASE BUILD UP



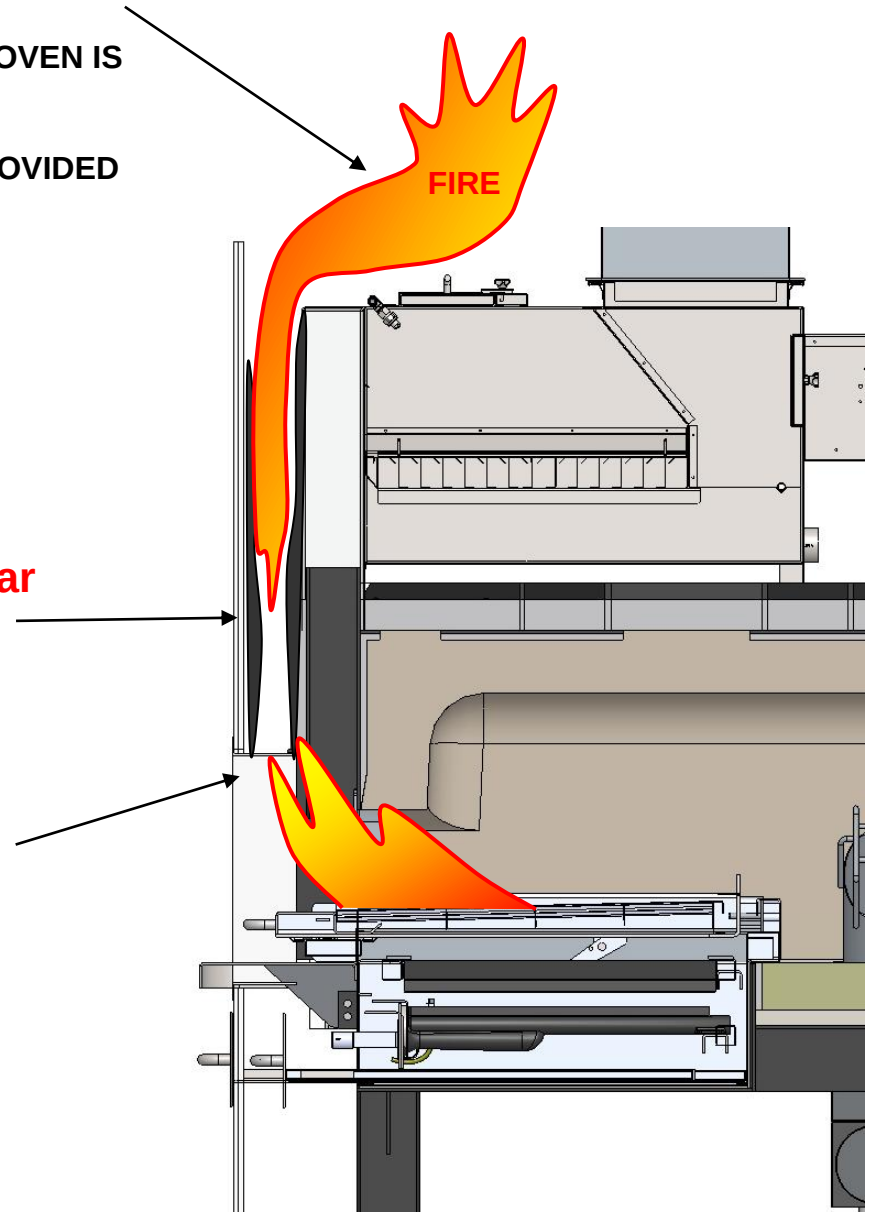
Possible cause of fire behind the façade

Poor sealing between façade and oven door leads to grease contamination between façade and oven wall. This grease contamination is then ignited by a flash fire off the grill.

Solution: Ensure that the area above the oven door and façade is fully sealed with a fire proof material. *(See Installation – Assembly section in this manual)*
For added safety, install an Ansul sprinkler head directly above the oven in the event of a fire in this area.

2. The fire, fuelled by a residual build up of grease, is drawn into the area above the oven igniting any flammable material in this area.

IT IS ESSENTIAL THAT THE OVEN IS INSTALLED CORRECTLY IN ACCORDANCE WITH THE INSTALLATION MANUAL PROVIDED


FIRE
1. Grease build up between the façade and spigot ignites from flash fire on Char Grill
THE AREA BETWEEN THE SPIGOT AND THE FAÇADE MUST BE SEALED WITH A FIREPROOF MATERIAL E.g. METAL STRIP

Ventilation Requirement

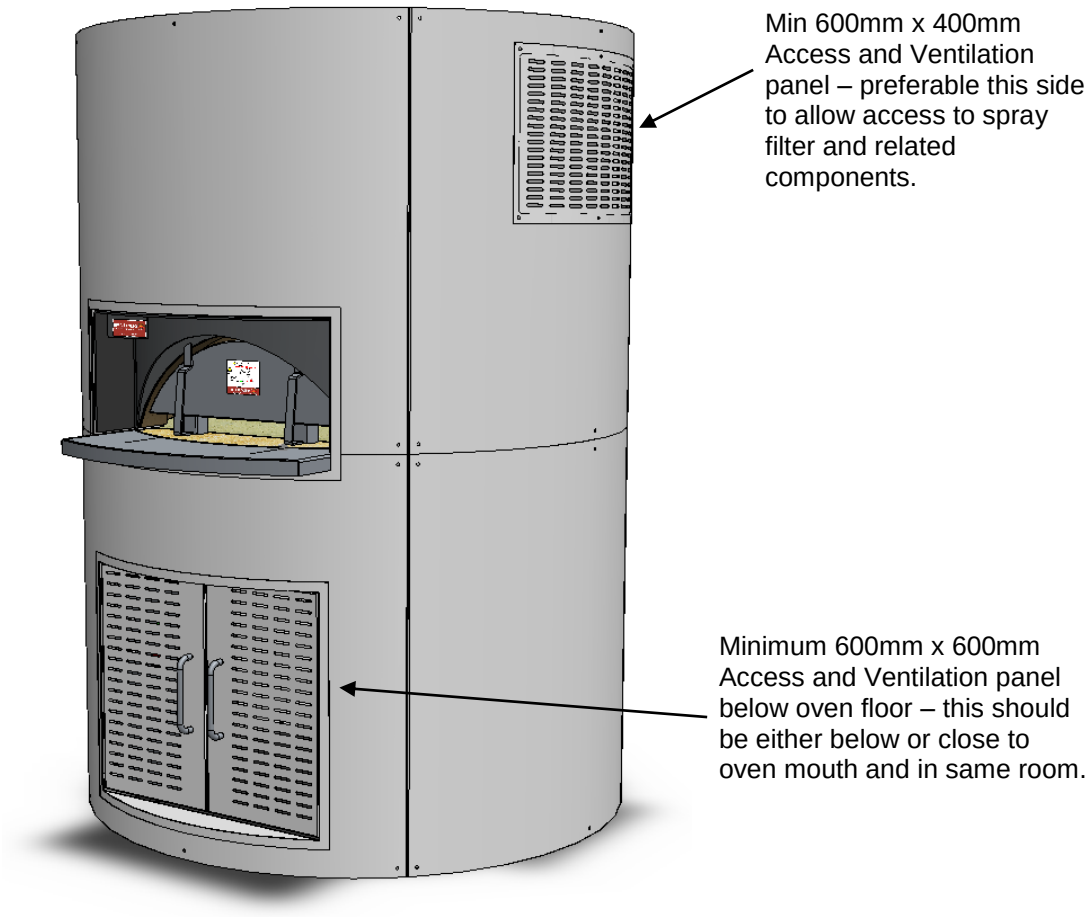
A very important area which is commonly overlooked with gas fired Stone Hearth Ovens is access and, most importantly, Ventilation to under and above the oven.

With many of Beech Ovens being gas fired there is either a Tube or Display burner mounted into the oven floor, which needs a fresh air supply to function correctly.

A common problem with the oven installation process is that insufficient ventilation is allowed for. This can result in the burner being starved of oxygen and not functioning correctly, or air is being drawn from above or below the oven causing the flame to “disappear” below the oven floor, causing the burner to fail. Both these cases result in poor oven operation and irregular temperature fluctuations.

Below is an image showing an example of the ideal location for Ventilation and Access panels in Beech Stone Hearth ovens.

NOTE: *The ventilation panel below the oven must be in the same room as the oven mouth to ensure that a balanced air pressure is obtained within the oven cavity.*

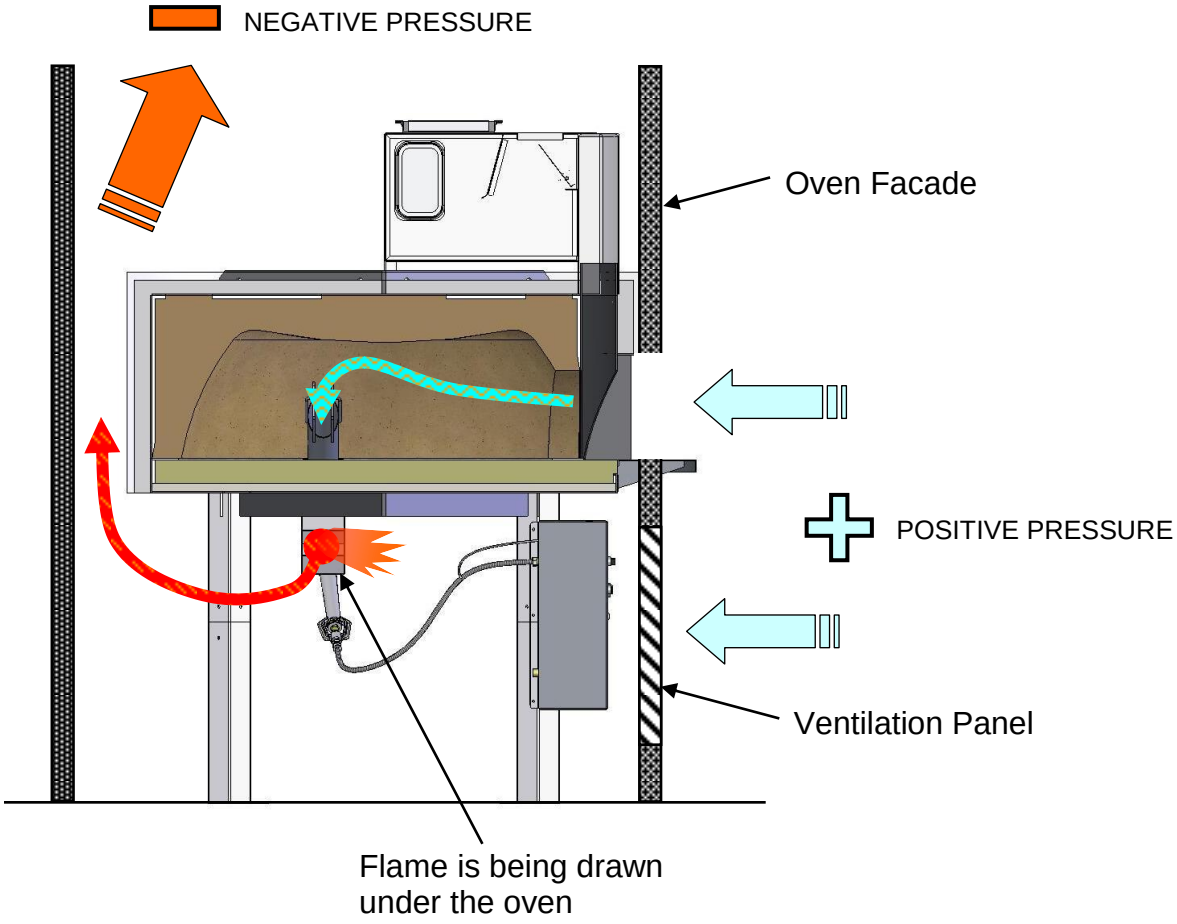

Min 600mm x 400mm Access and Ventilation panel – preferable this side to allow access to spray filter and related components.
Minimum 600mm x 600mm Access and Ventilation panel below oven floor – this should be either below or close to oven mouth and in same room.

Tube Burner Ventilation

From October 2010, all ovens supplied with a tube burner will also be supplied with a ventilation kit that should be installed as per the instructions below. This is designed to eliminate any problems related to poor or insufficient ventilation resulting in the flame being drawn or “disappearing” under the oven floor.

It is critical that this ventilation tube be installed correctly, **and in the correct position,** to eliminate the risk of poor oven performance, erratic flame behaviour or flame failure.

In some instances the ventilation panels both below and above is not sufficient to overcome excessive air movement from above and around the oven. This is commonly caused by the ceiling space being used as a return air plenum for the restaurant air conditioning and ventilation systems.

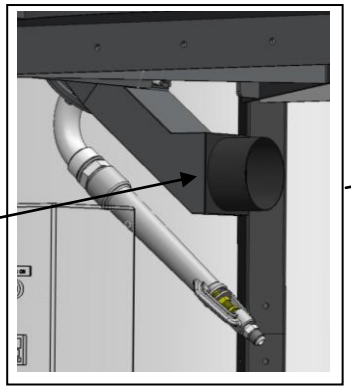


Even though a ventilation panel is fitted below the oven, the negative pressure above the oven can be greater than the pressure below the oven. Because the tube burner is installed in the floor of the oven, the hole in the oven floor is a clear passage for air to flow, thus sucking the flame with it.

Installing the Tube Burner Vent

All ovens with a tube burner supplied from October 2010 will be fitted with a revised tube burner mount which has a 125mm round attachment.
(Retro-fit kits are available for earlier rectangular models)

New design tube burner mount



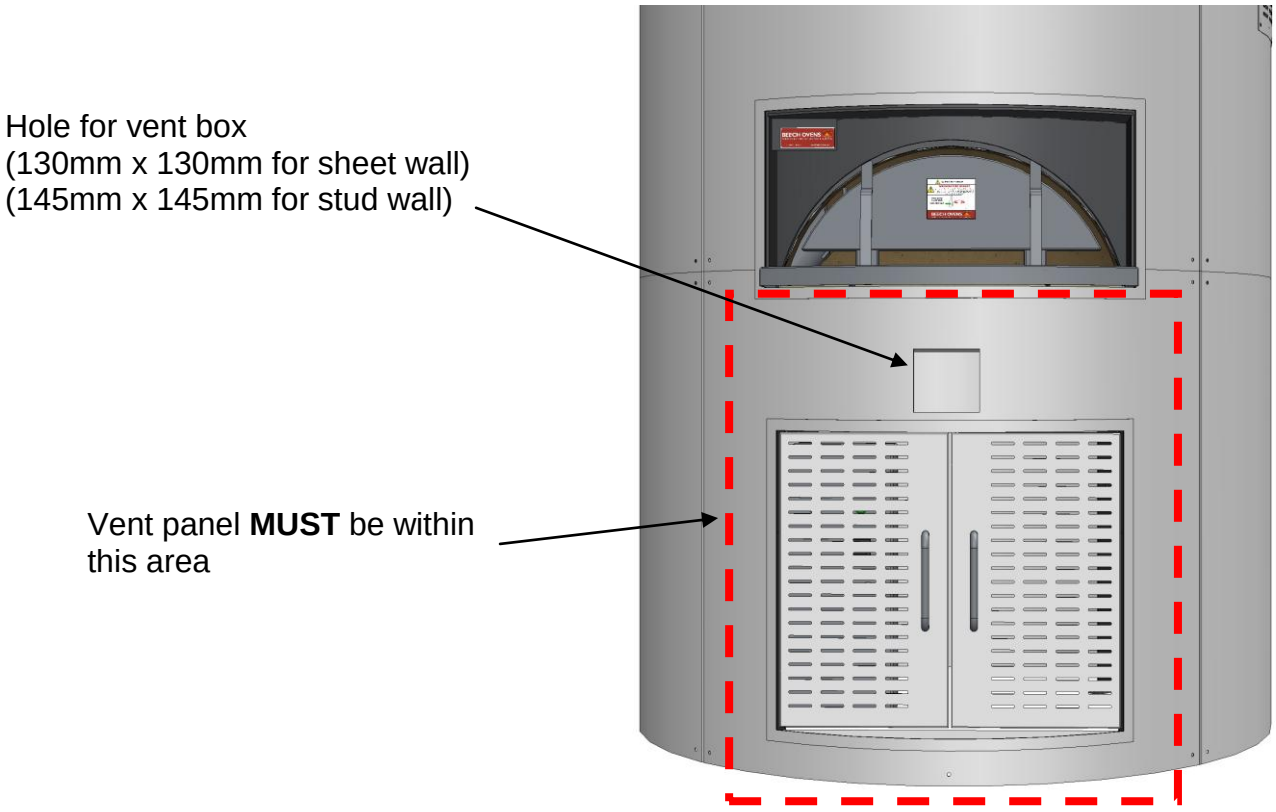
The following fittings will also be provided;

- Vent box with vent panel with removable front panel

- 2-3 metres *(approx)* of 125mm semi-rigid aluminium flexible duct

Keeping in mind to leave enough room for the 125mm flexible tube, cut a hole in the front façade panel big enough to house the vent box.

NOTE: *The vent **MUST** be below the oven mouth and in the same room as the oven mouth. It cannot be installed in an adjacent room.*

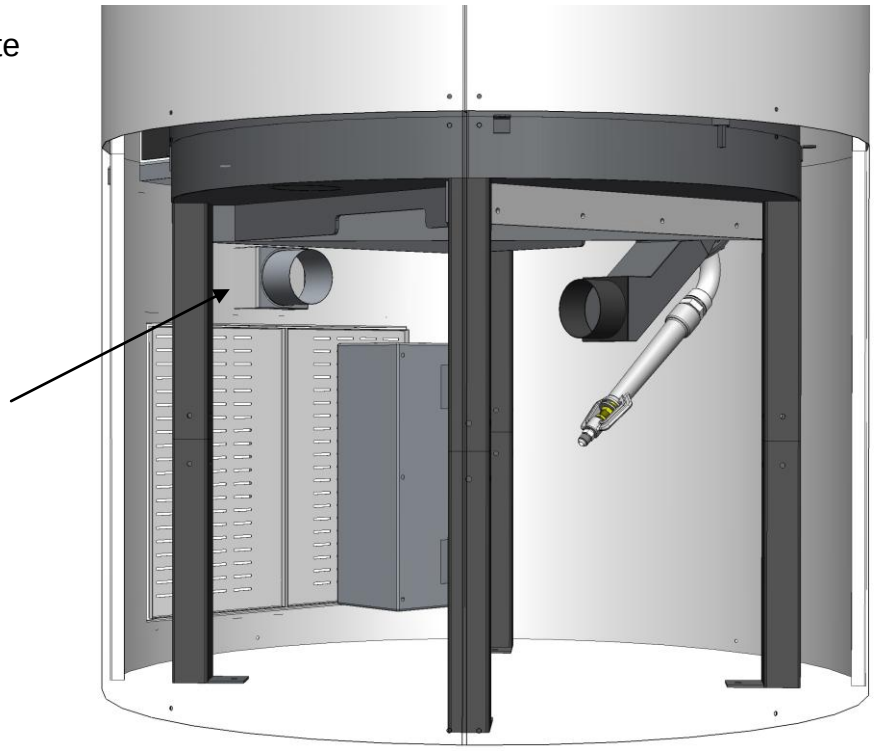


The reason for having the vent under the mouth of the oven is to ensure that the pressure into the oven mouth is the same as that supplied to the tube burner, thus eliminating the pressure differential through the tube burner hole.

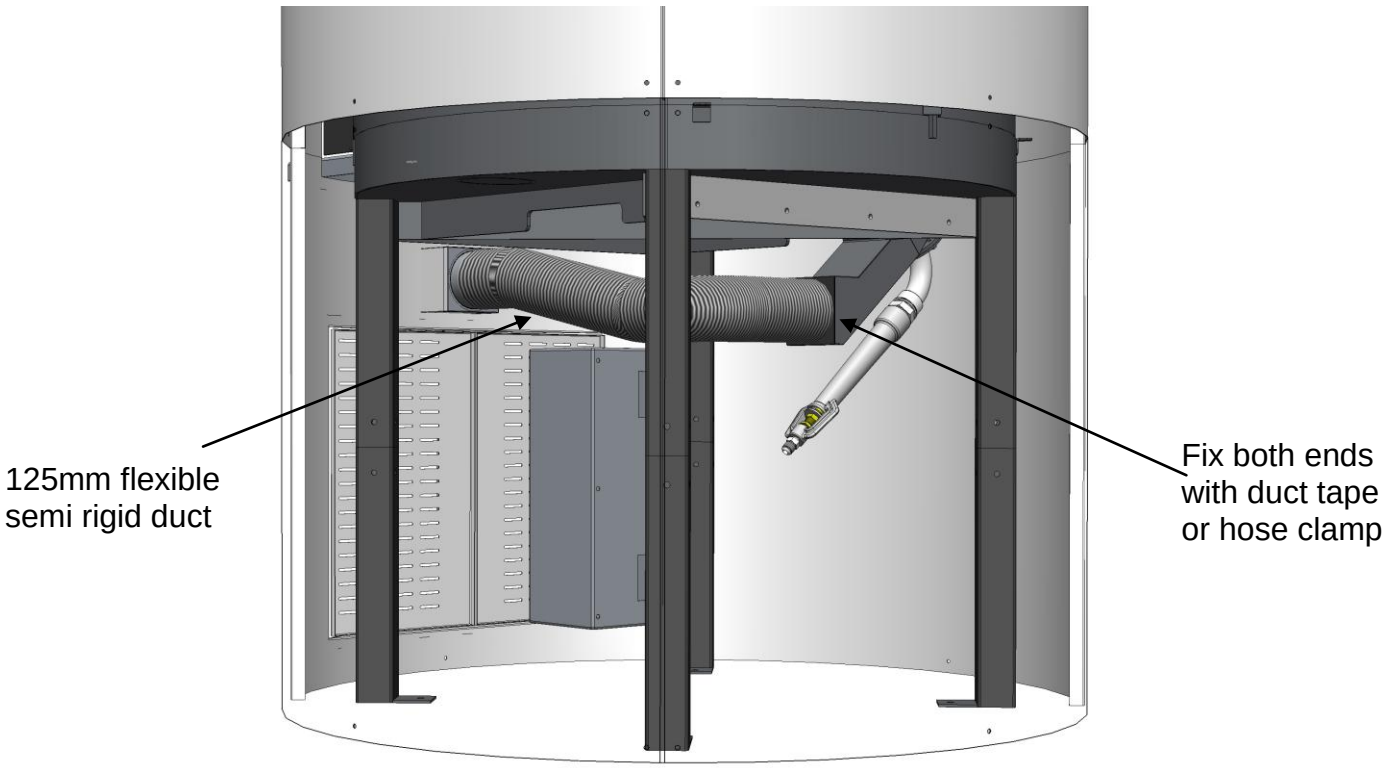
Access is still required to the underside of the oven, though with the ventilation panel installed; this can now be from behind the oven or in an alternate location other than in the front face of the oven.

The control cabinet can also be remotely located as long as it is accessible for both the operator and maintenance staff.

Install the vent box into the façade wall using appropriate fixings.



With the vent box now in position, connect the vent box to the tube burner mount using the supplied 125mm semi-rigid flexible duct tube. This should be fixed using either aluminium duct tape or a suitably sized hose clamp.



With the duct connected the front vent panel can now be fitted using the 4 screws as supplied. Do not over tighten.

Vent panel fixing screws (x4)

NOTE: *Do **NOT** cover the vent panel during operation. This may cause the flame to stifle and fail.*

Gas Systems overview

The gas management system automatically controls and monitors the oven temperature and can maintain an impressive display burner. The system features easily programmable and adjustable components. The use of high quality, electronic ignition and flame management components combine to give a simple and reliable system.

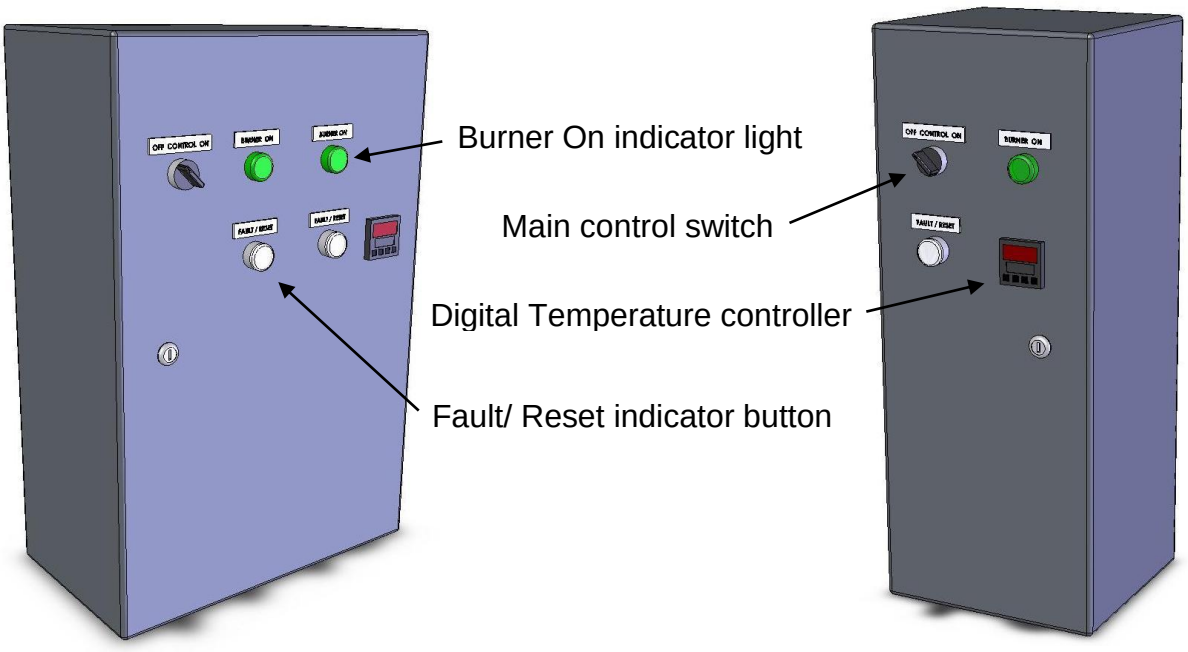
Gas Control Cabinets

There are three types of gas systems available. A single burner or Gas back-up system (GB), a double burner or Full Gas (FG) system and an independent gas Char Grill (CG) option. The Char Grill option is a fully independent system connected *(in most applications)* directly to the reticulated Gas supply. *(Australian systems require an additional Grill Interlock.)* The double burner system (FG) system is two independent burners together with shared control components, ideally suited to larger ovens.

The Gas control cabinet has the following external controls and indicators:

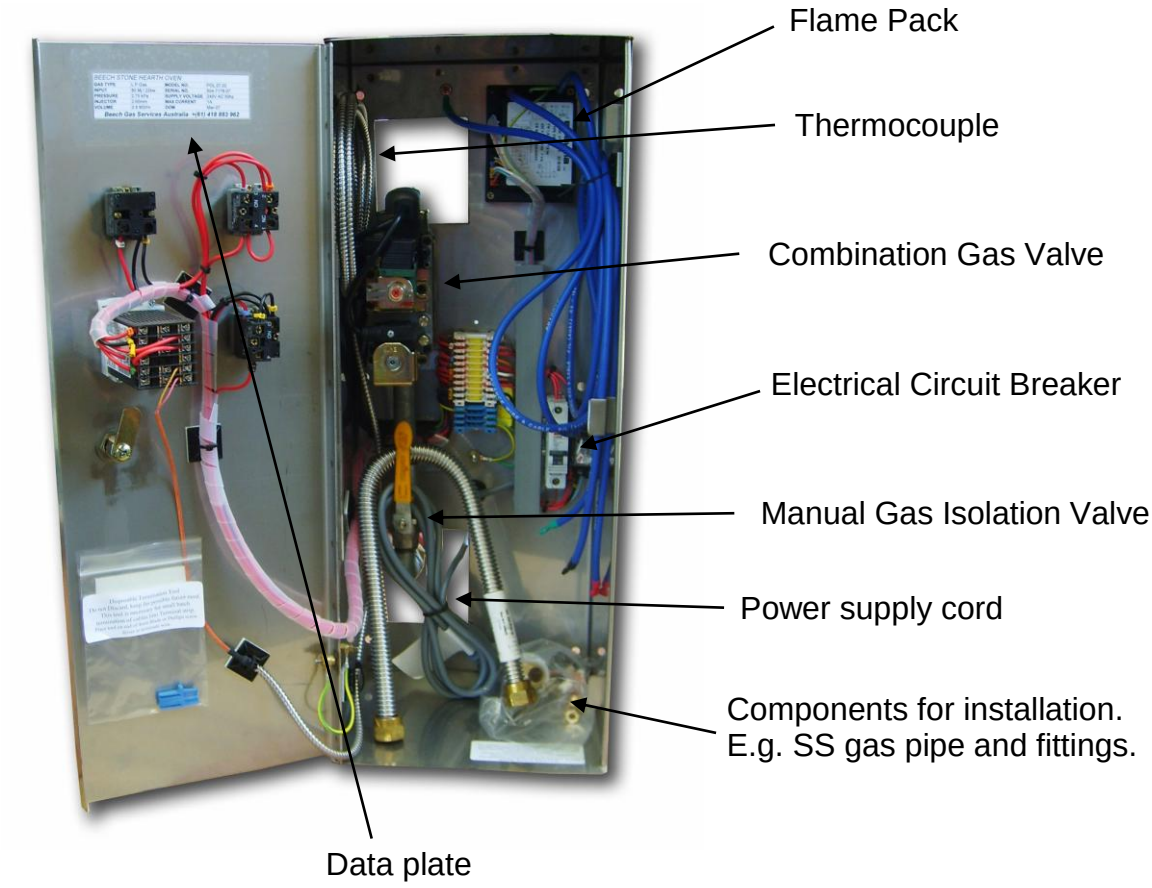
Full Gas control cabinet (Double burner)

Gas Back-up control cabinet (Single burner)



The thermal input of the Gas system, depending on the application *(oven size and burner type)* is between 50 and 100 Mega Joules. *(Refer to the Data plate inside the Gas cabinet for specific details.)*

The Gas control cabinet has the following internal components:



NOTE: *The Gas Control cabinet shown is a single burner system or Gas Back-up (GB) control cabinet. The Full Gas (FG) control cabinet has double of some of these components.*

The Gas control cabinet will also contain some components required for installation when delivered as seen here in the bottom of the cabinet.

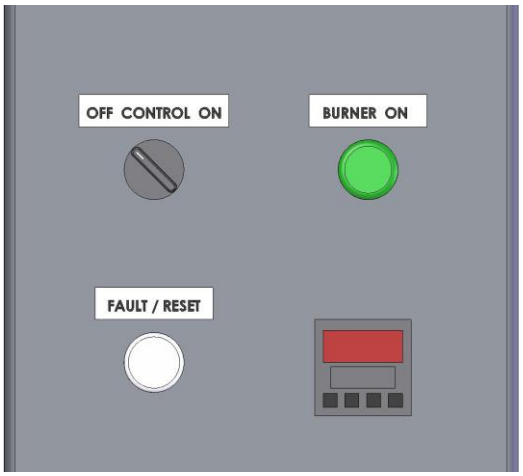
The system is fitted with an emergency manual gas isolation valve located inside the control cabinet. This is near the bottom of the cabinet and is prior to the Combination Gas valve which also incorporates the pressure regulator and High and Low flame adjustments.

See more information in the General Technical Details at the rear of this manual. A data plate is also visible in the door of the oven gas control cabinet stating technical details for the specific system.

Gas Control Cabinet Functions

Main Control Switch

The Main Control Switch has three positions:



OFF
Both temperature controller & burner are off in this position.

CONTROL
The temperature controller only is energized. In this position the temperature controller will read the current oven temperature (PV) and the set point temperature (SV). The current oven temperature (PV) is monitored at the stone hearth *(floor)* level. The actual oven temperature will be higher than indicated. This is useful if firing on timber to easily see the cooking temperature. This is a read out only and has no control over the oven temperature with the control switch in this position.

ON
In this position the oven will start automatically, cycling the gas system to maintain the preset temperature or set point temperature (SV) of the oven.
The operation of the gas flame will cycle automatically from Low Flame to High Flame or Off as required to maintain the set point temperature.

See "Digital Temperature Controller" description below for more details.

Burner On Indicator Light

This light is lit when the **ON** position is selected on the main control switch and a flame is preset inside the oven.

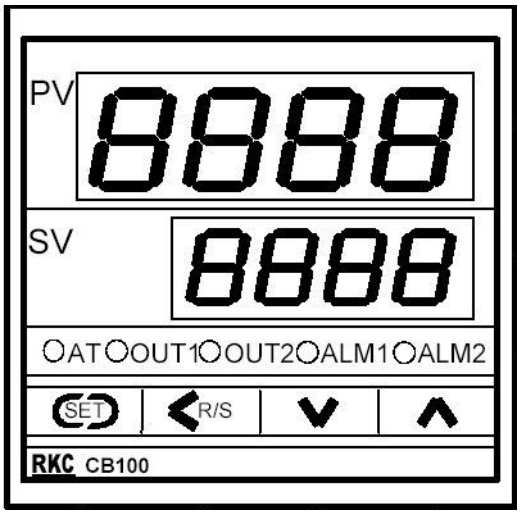
*The main control switch should always be set to **OFF** when any service work or inspections occur. Disconnect power from the wall socket. All service work should be carried out by a qualified and authorized technician.*

Fault/ Reset button

In the event of the burner failing to light, the Fault/ Reset button will light and the burner will go into 'lock-out mode'. In this mode, the oven is 100% safe; no gas can flow.

To restart the burner from 'lock-out mode' *(white light on)* press the white light 'reset' button. If the burner fails to light after three attempts, turn the control switch to **OFF** and refer to the troubleshooting section of this manual or call in a service professional.

Digital Temperature Controller



The Digital Temperature controller has two (2) main functions. To display the current oven temperature (PV- Present Value) and an adjustable setting to enable the operator to determine the desired oven operating temperature (SV - Set point value).

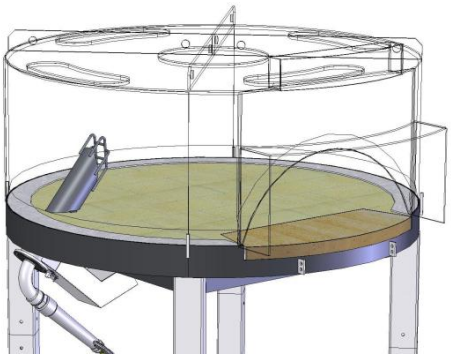
To change the set point (SV) temperature up or down;

- Press **SET**
- Press ◄**R/S** to move the degree of change. *(i.e. to change tens or hundreds)*
- Press the ▲ (up) or ▼ (down) arrows until desired temperature is selected
- Press **SET** to enter the information

See Section 3 ***Operation*** *for the different temperature control procedures.*

Gas Burners

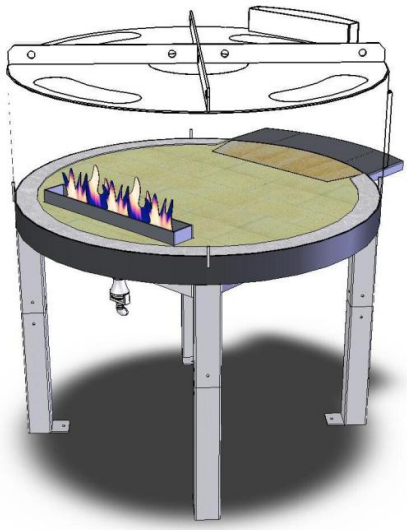
There are three (3) types of burners available:



Tube burner

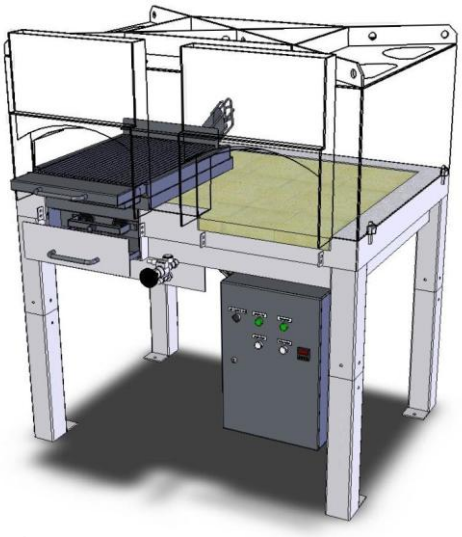
This burner mounts below the oven floor and fires into the oven chamber through a floor brick with a 100mm hole. The advantages of this burner are little oven floor space used and good back-up properties for dual fuel use.

NOTE: *Wood should not be placed on, or lean against, the tube burner shroud – any ash or debris that falls down the burner tube will cause the burner to fail.*



Display burner

This burner is primarily for full gas ovens and is used for its spectacular visual appearance. The Display burner has similar heating properties to the Tube burner. It is not recommended for dual fuel as ash and embers can easily contaminate the burner and Tri-electrode.



Gas Char Grill

This option gives the added convenience of a slide out grill drawer with a separate and independent gas system of burners and radiants for grill cooking inside the oven.

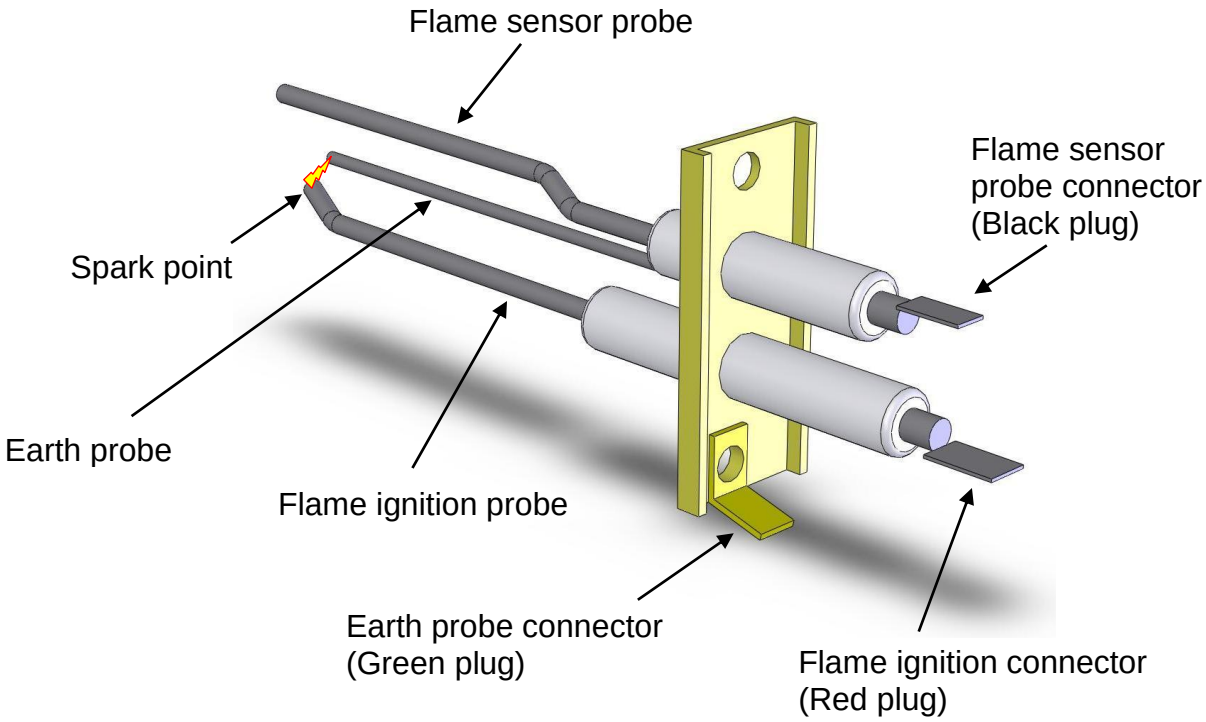
Both the Tube and Display burners are controlled by the Gas Control system that monitors the oven temperature using a sensor *(thermocouple)* located within the oven space. This is connected to the Digital Temperature controller which in turn controls a Flame Pack and a Combination Gas Valve. The Char Grill is manually regulated.

Tri-Electrode/ Igniter Assembly

A high voltage spark, energized from the Flame Pack, *(which also controls the Flame Failure System)* ignites the burner. This Flame Pack will also immediately close the main valve *(Combination Gas Valve)* in the event of a fault, causing flame failure.

The Tri-electrode/ Igniter assembly includes 3 probes;

-
- Flame ignition probe
- Flame sensor probe
- Earth probe



NOTE: *The Tri-electrode assembly shown is for the Tube burner. Size and connection points for each Tri-electrode may vary between the different burner types.*

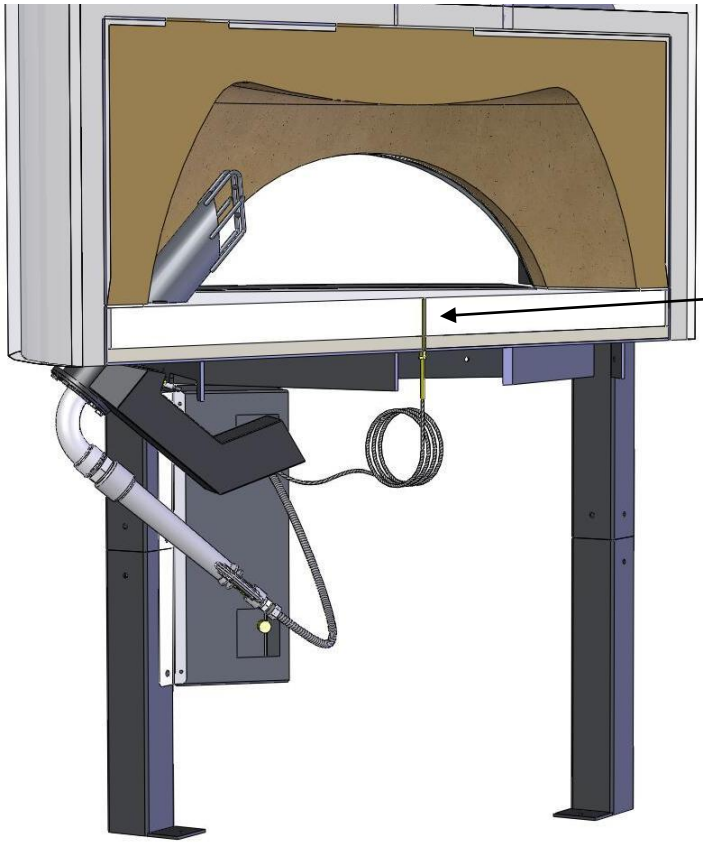
It is imperative that the probes are correctly connected, as incorrect wiring will cause damage to the Flame Pack.

Because the Flame ignition probe relies on the earth probe to create a spark, it is vital that the Flame ignition probe, including its cable and connector, are not in contact **OR** close proximity of any hot surface or sharp edges. If this occurs, a spark will not be created at the spark point, resulting in the gas failing to ignite.

It is also vital that the “Spark point” and entire Tri-electrode assembly be kept clean and free of foreign objects. If the probes are not clean a spark will not be created.

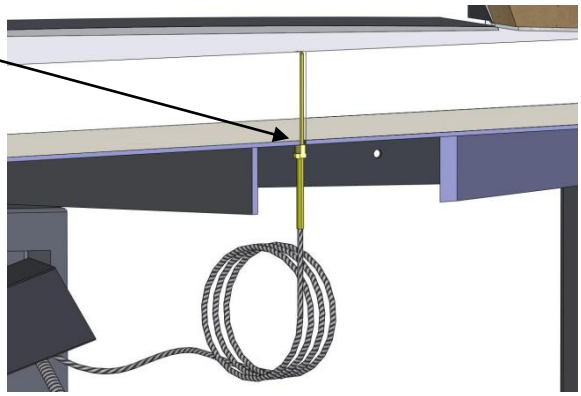
Thermocouple

The Thermocouple is a probe which is inserted into the oven floor from beneath, finishing flush or slightly below working surface in the oven space. The positioning of the Thermocouple varies depending on the oven type. The Thermocouple is connected to the Digital Temperature controller and supplies information relating to the current oven temperature.



A cross section of the RND1300 Round oven shows the Thermocouple, in this instance, mounted in the middle of the floor and connected back to the Gas control box

A close-up view of the Thermocouple shows the gland nut mounted into the underside of the oven base.



Beech Ovens Pty Ltd CONFIDENTIAL PROPRIETARY

THERMOCOUPLE LOCATIONS

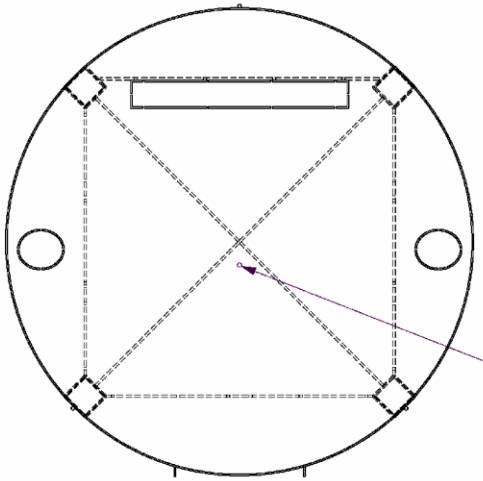
THE DIAGRAMS BELOW SHOW THE PREFERRED LOCATION FOR THE THERMOCOUPLE FOR ALL STANDARD OVENS.

THE POSITION FOR CUSTOM OVENS SHOULD FOLLOW THE SAME PRINCIPALS WHERE POSSIBLE UNLESS OTHERWISE STATED.

POSITIONING THE THERMOCOUPLE PROBE IN THIS LOCATION GIVES THE MOST ACCURATE TEMPERATURE READING AND IS LESS PRONE TO HAVING A FIRE PLACED UPON IT.

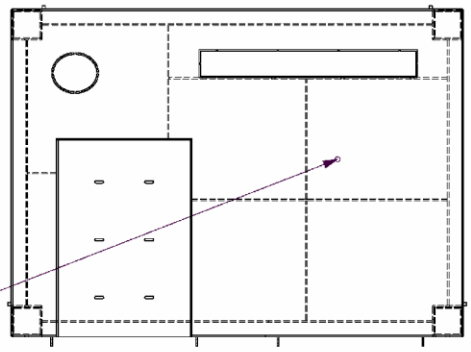
BE SURE TO INSTALL THE THERMOCOUPLE SO THE TIP OF THE PROBE IS 2-5mm BELOW THE COOKING SURFACE.

DO NOT BUILD OR PLACE A FIRE ON THE THERMOCOUPLE.

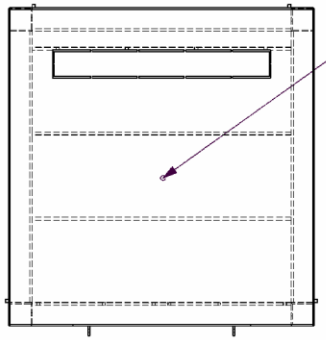


ROUND OVEN
(RND0900-1800)

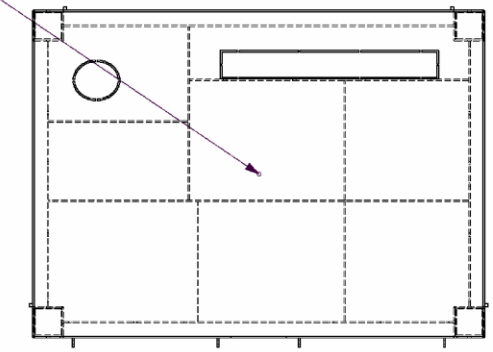
THERMOCOUPLE LOCATIONS



RECTANGULAR GRILL OVEN
(RGO1250)



RECTANGULAR OVEN
(REC0850)



RECTANGULAR OVEN
(REC1250)

REV.	DESCRIPTION OF CHANGES	DATE	CHANGED BY
0	ISSUED FOR CONSTRUCTION		

LAST EDITED: Saturday, 19 January 2008 7:20:11 AM

©Copyright 2006 Beech Ovens Pty Ltd. All rights reserved.

BEECH OVENS
Australia
(617) 3397 0277

Drawn S Trood | Checked | Scale 1:15 | Date 19/01/2008

THERMOCOUPLE LOCATIONS
ALL OVENS
STANDARD

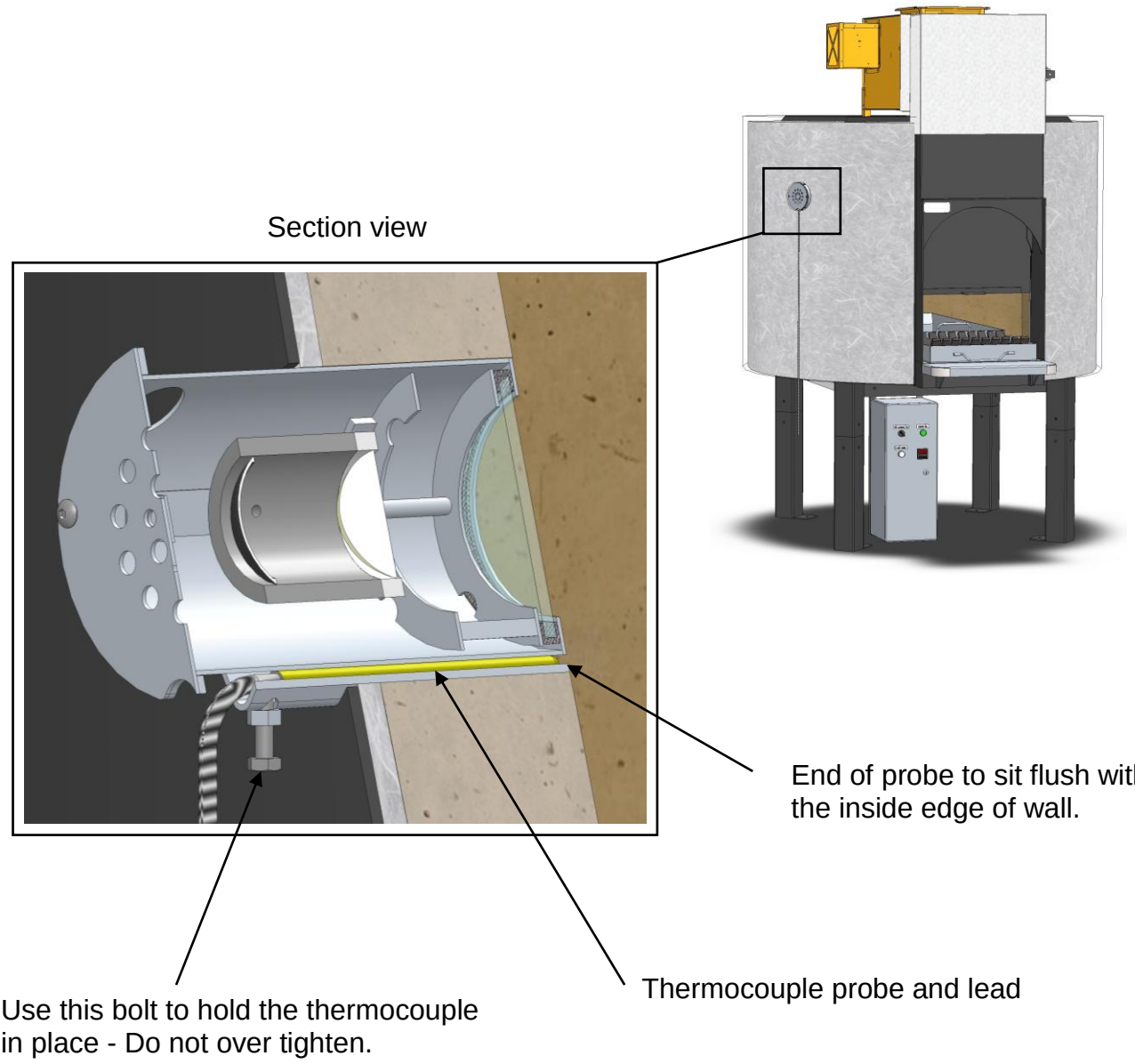
A3
NTS - SITE MEASURE

THERMOCOUPLE LOCATIONS - DETAILS

Duck Oven Thermocouple

The Duck Oven thermocouple is located directly below the spotlight and is accessed using the spotlight access panel. It is located here to give a true indication of the temperature where the ducks are situated in the oven, unlike a pizza oven which has the thermocouple in the floor to sense the temperature where the pizzas are cooked.

Be sure that the thermocouple probe does not protrude through the wall of the oven. It should be located flush with the inner wall of the oven.


Section view
End of probe to sit flush with the inside edge of wall.
Thermocouple probe and lead
Use this bolt to hold the thermocouple in place - Do not over tighten.

System Connection

The Gas control cabinet is delivered pre-set from the factory, though should be re-checked upon connection. Gas pressure should be checked as per the Flame Calibration section in this manual. The following section explains the installation and connection procedures for the Gas and Electrical systems.

Contractors Responsibility

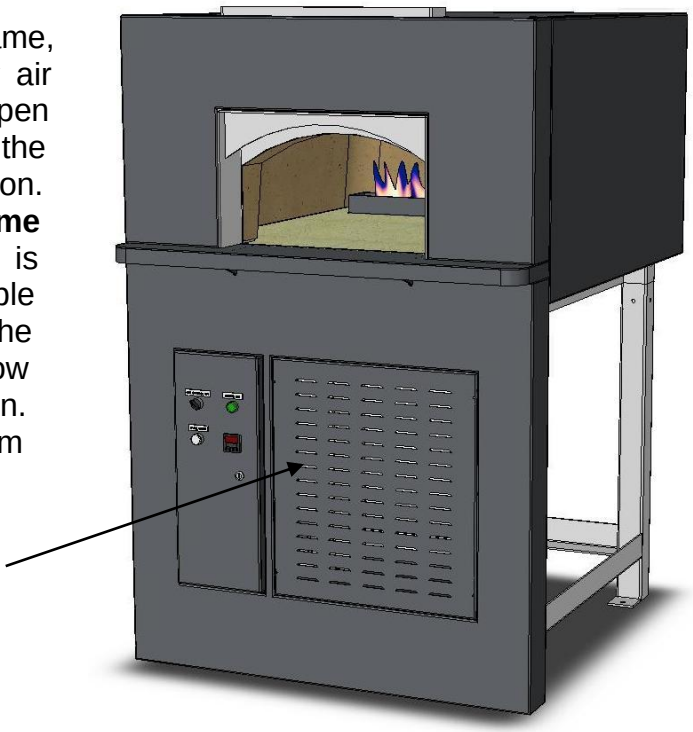
Fitting the Thermocouple, Tri-Electrode leads and Gas line connection are all part of the connection procedure. Always check for correct set-up for local gas supply. The system will require earthed mains electricity 220-240V at 50Hz and a gas supply line for final connection. Please ensure that the gas supply line is sufficiently sized to handle the gas load.

Refer to the Gas Data plate located inside the Gas control cabinet.

All work required for installation must be carried out by approved persons and comply with all local codes and regulations in force at time of installation.

Venting the Oven

With all ovens using Gas, to sustain a flame, the oven utilizes primary and secondary air (oxygen) from below the oven floor. An open vent must **always** be made available to the underside of the oven for this reason. **Ventilation must come from the same room as the door of the oven.** This is usually incorporated into a removable inspection or access panel at the front of the oven, or at a convenient location as to allow easy access to the underside of the oven. The size of the vent should be a minimum of 600mm x 600mm.



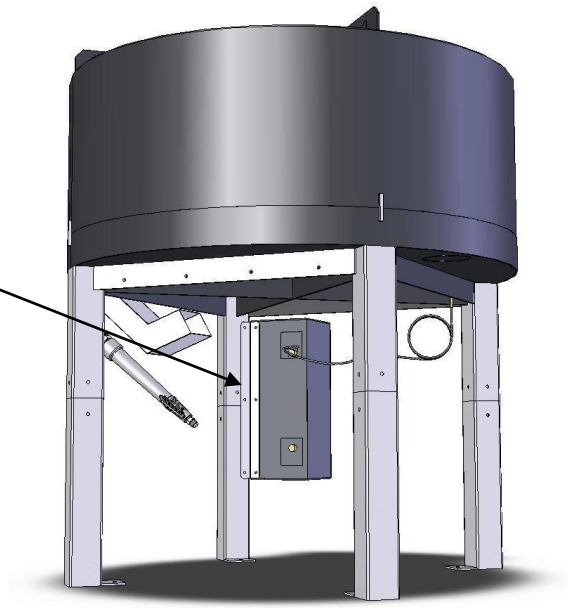
Typical access panel with louvers to allow fresh air (oxygen) to feed the burner flame

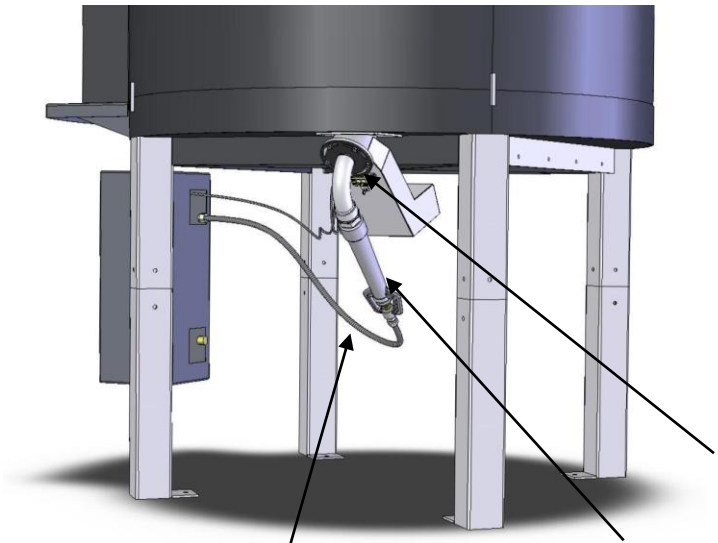
For more information on this matter see the **Ventilation Requirement** section in this manual.

Connection Procedures

Mount the stainless steel gas control cabinet to the brackets supplied. *(Usually on the front leg of the oven, or hanging from the front base strut with two (2) angles)* There is a key supplied to open the Gas control cabinet door. Be sure to keep this key in a safe place.

Gas Control box as seen from rear of oven.
(In this instance, mounting bracket attached to RH side leg)





Connect the 12.25mm stainless steel pipe supplied, from the Combination Gas valve to the burner/ inspirator. No sealant is required on this type of connection.

Tube burner mounting flange

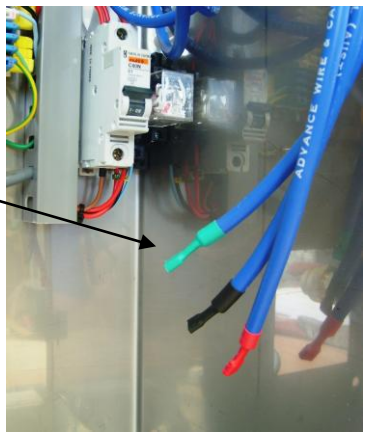
Inspirator

12.25mm SS pipe

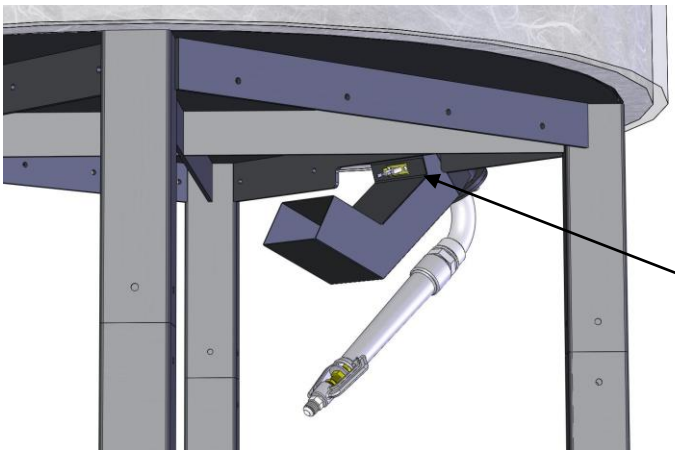
NOTE: *When fitting the Tube burner, the inspirator's position may be swivelled to best accommodate the SS pipe length by loosening the bolts on the mounting flange. Be sure to tighten the bolts when positioning is final.*

Connect the high-tension leads from the Flame Pack to the Tri-electrode at the burner head. The cables will normally be delivered coiled within the Gas control cabinet. These connectors are colour-coded and different sized plugs to ensure connection cannot be mixed up.

The cables for the Tri-electrode are found in the Gas control cabinet.



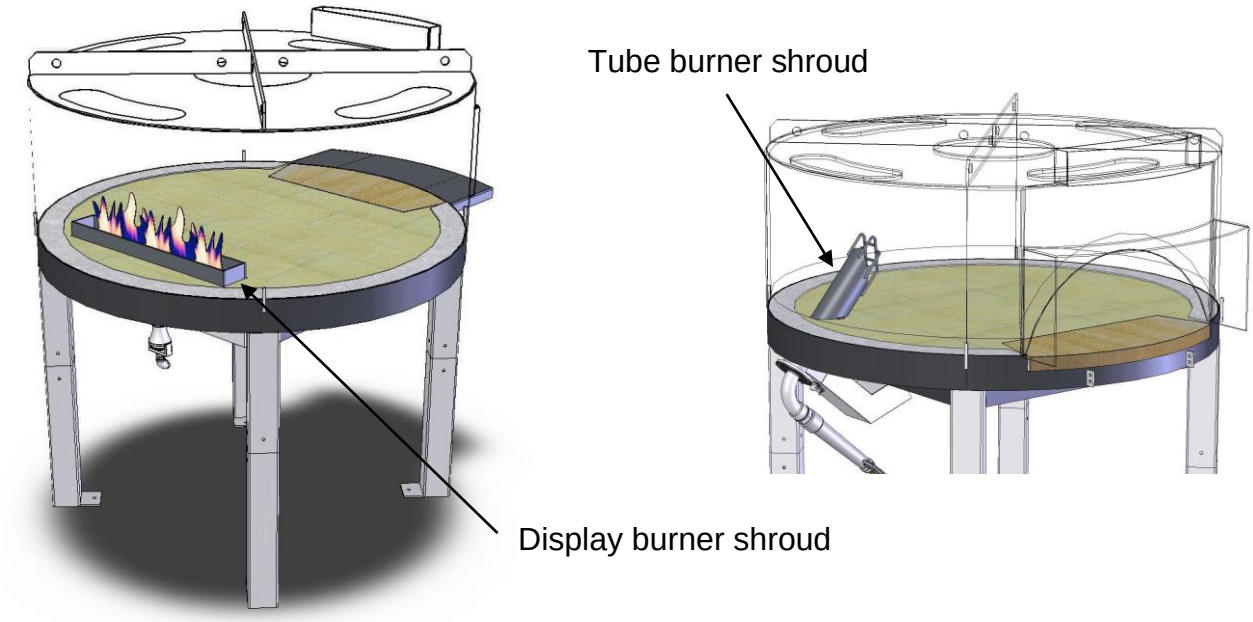
NOTE: *When coiling the leads to the Tri-electrode, be sure not to kink or damage the leads. The leads are to be routed in a tidy manner using the supplied clips and cable ties under the oven base ensuring that they are not attached to other cables, metallic or sharp objects.*



Tri-electrode connection point *(RND1300 Round oven with Tube burner shown)*

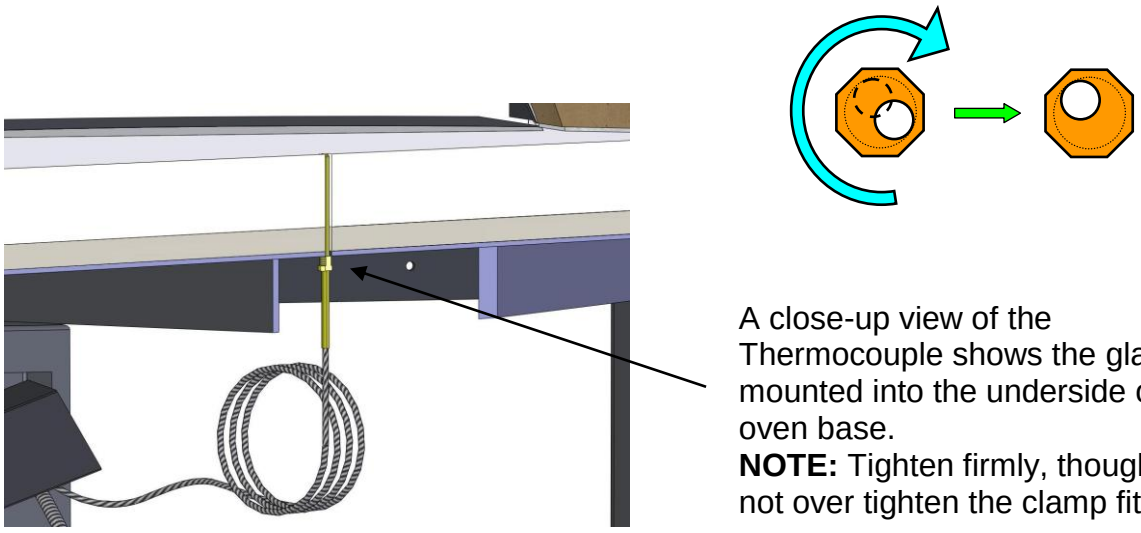
NOTE: *Connection points vary with different burner and Oven types. Where a display **and** a Tube burner are fitted, the Display burner will ALWAYS assume position 2 (Default burner). This is done to ensure that the Tube burner will cycle between High Flame and Low Flame and the Display burner will always remain on as a feature burner.*

The stainless steel burner shroud should now be fitted inside the oven. The main purpose of the shroud is to protect the burner from debris and foreign objects. Ensure that these are fitted properly, as failure to do so may result in burner and/or ignition problems.



Mount the 6mm-diameter Thermocouple probe into the pre-fitted brass gland nut in the oven base. The tip of the Thermocouple should be flush or 0-3mm below the oven cooking surface.

(The hole in the gland nut is drilled eccentric to allow for any misalignment that may occur between the gland nut and the base brick during transport. Should the Thermocouple not align with the hole in the base brick, turn the gland nut slowly until it aligns correctly as per the diagram below.)

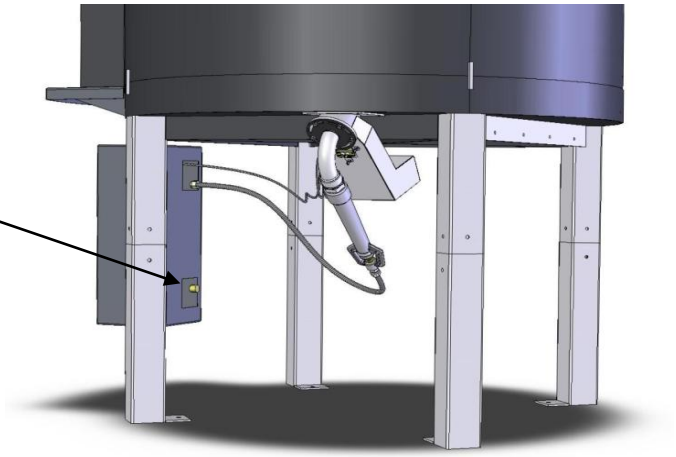


A close-up view of the Thermocouple shows the gland nut mounted into the underside of the oven base.
NOTE: Tighten firmly, though do not over tighten the clamp fitting.

NOTE: *When coiling the lead to the Thermocouple, be sure not to kink or damage the lead. The lead is to be routed in a tidy manner using the supplied clips and cable ties under the oven base ensuring that it is not attached to other cables, metallic or sharp objects.*

Connect to reticulated gas supply at the 19mm flare fitting at the base of the gas cabinet. An isolation valve should be fitted prior to the gas control cabinet to allow gas supply to be completely isolated from the appliance. Purging of the gas supply lines may also be necessary. Check with your Gas installer that these items are done in accordance with local regulation. NOTE: Gas can be odourless in new installations.

19mm reticulated Gas supply connected here.

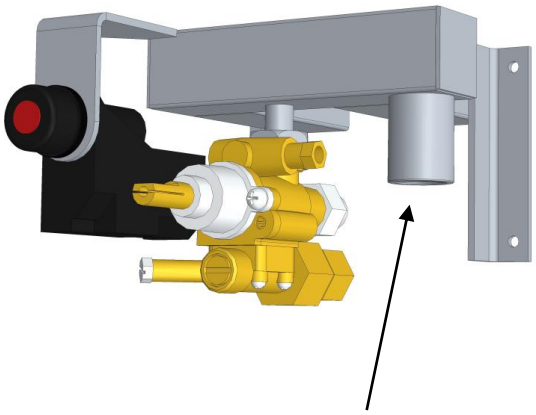


NOTE: *Connection of the Gas supply line should be carried out by qualified personnel. Be sure to check for correct gas type and set-up for local gas supply. Be sure that the lines are purged in accordance with local regulation.*

Char Grill Connection

A separate gas supply is required for the Char Grill. This can be taken from the main gas supply line, though care must be taken to ensure the correct line size is achieved to handle the gas load. *(Refer to **General Technical Details** at the rear of this manual)*

This connection should have an isolation valve fitted prior to the gas manifold. For Australian installations a ‘slam-shut’ valve is supplied to meet requirements of AS5601.



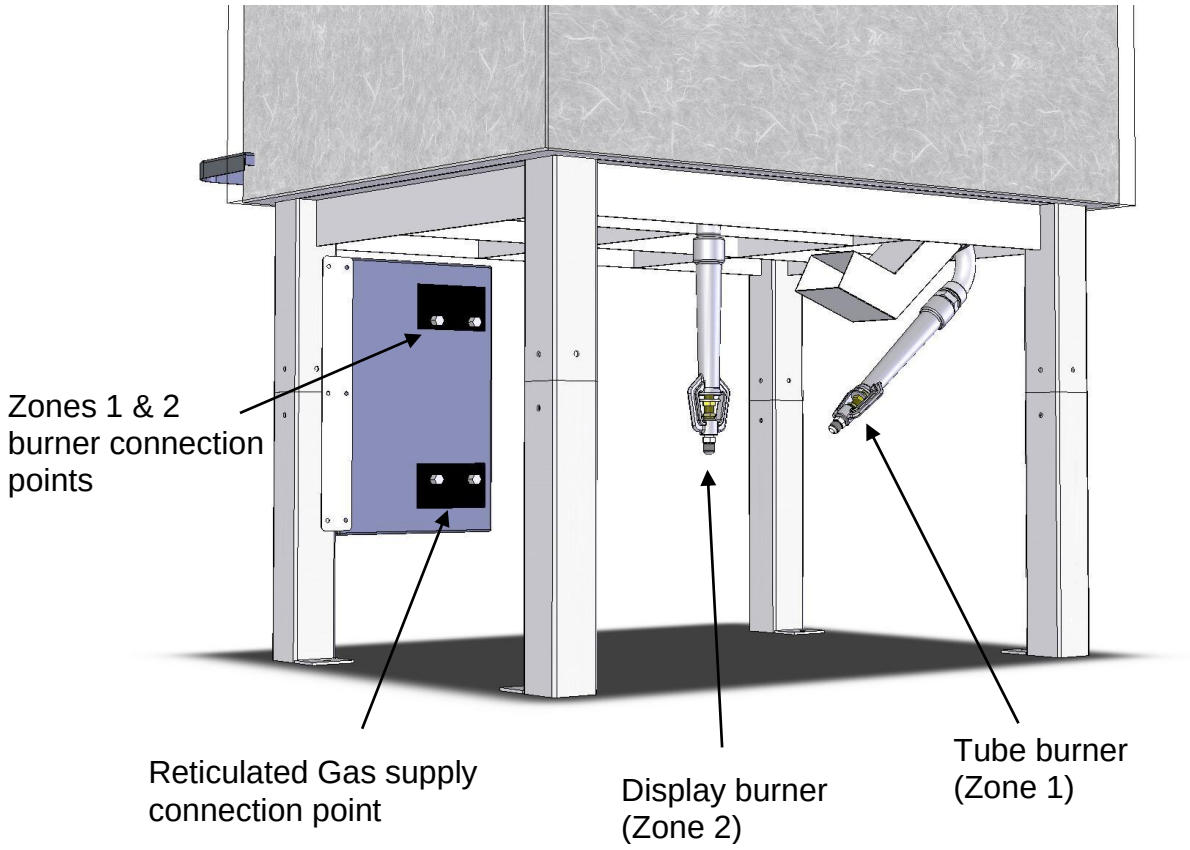
Char Grill manifold

Double Burner Installations

Most two (2) burner ovens use a Tube burner and a Display burner. The **Display burner** is expected to be the primary burner and is connected to **Zone 2** components. This is done to ensure that the Tube burner will cycle between High Flame, Low Flame and Off and the Display burner will cycle only between High Flame and Low Flame, remaining on as a feature burner. *(The display burner will turn off at around 400°C.)*

To ensure that each burner is connected correctly each Burner, Combination Gas Valve and Flame pack are labelled with corresponding zone numbers; Zone 1 and Zone 2. It is critical that all Combination gas valves, Burners and Flame packs are connected to the corresponding zone components.

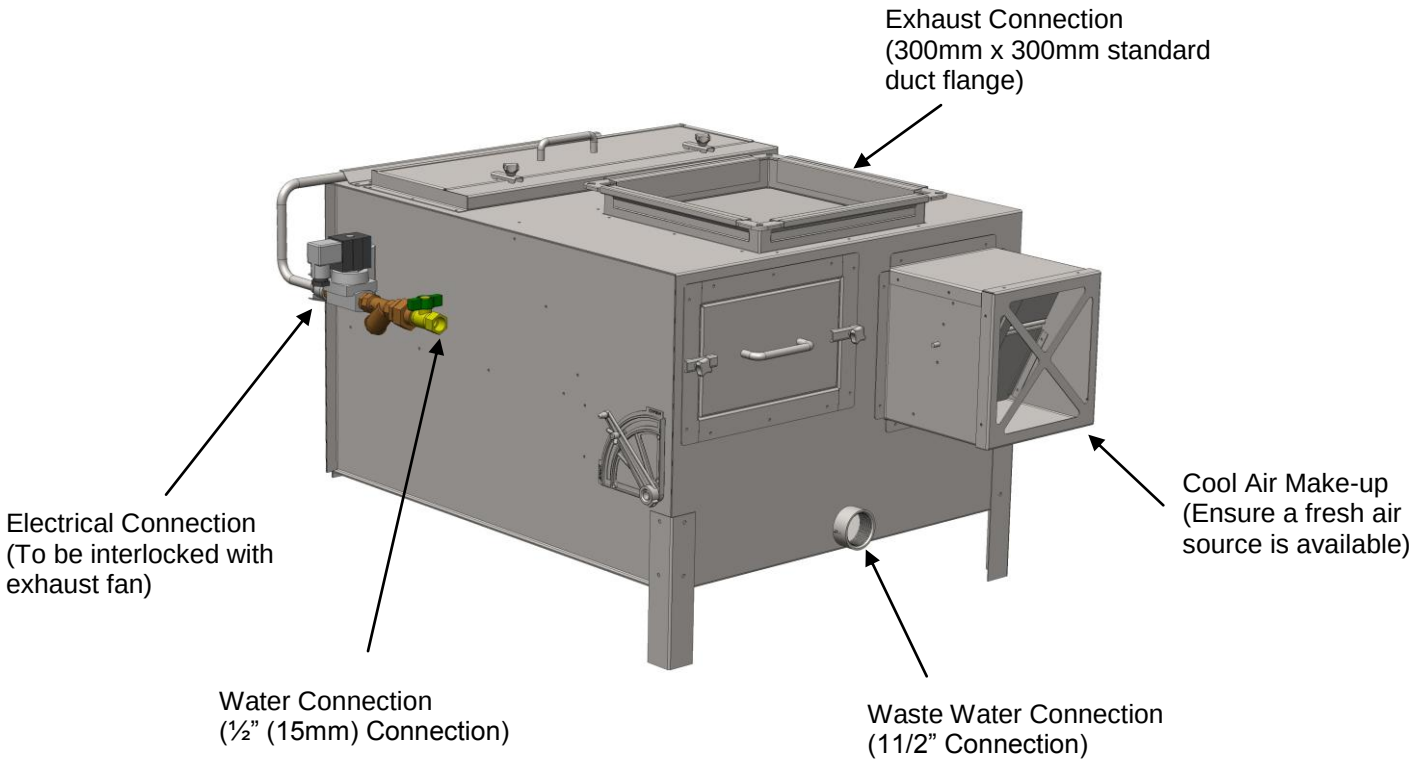
If this labelling seems incorrect or there is confusion as to which burner should be connected to which component, please contact Beech Ovens Technical Support for assistance. technical@beechovens.com.au



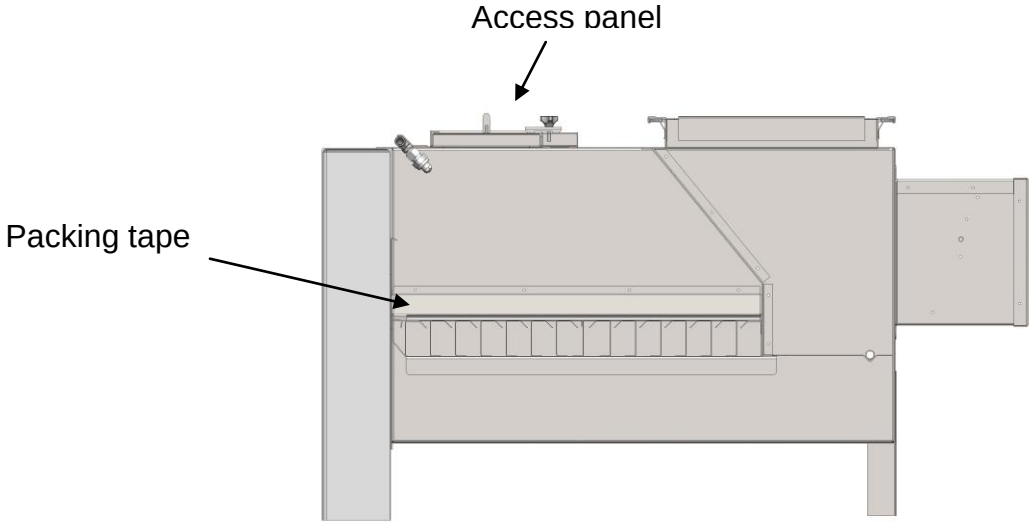
Spray Filter Connection

The diagram below shows the connection location for the spray filter services.

The services details are outlined in the **Spray Filter – Technical Specifications** section of this manual.



When installing the Spray Filter, be sure to remove any packing tape holding the filter in place. Loosen the nuts on the top access panel and remove the panel. Remove the packing tape and making sure that the filter is securely in its correct position *(as shown below)* replace the access panel.



Window Installation

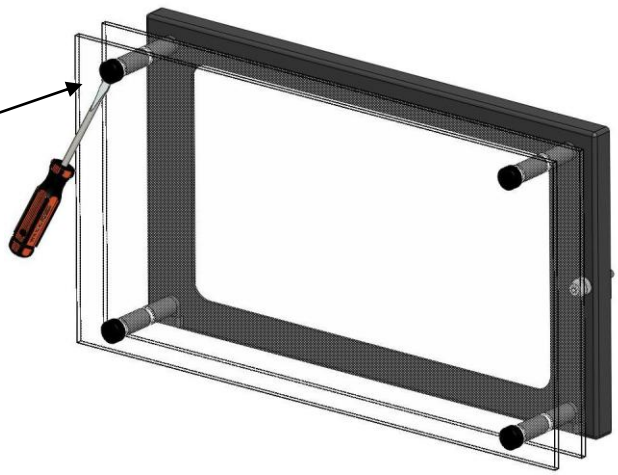
From July 2010, Beech Ovens have introduced a new design for the viewing window assembly. This new design is to ensure that the outer surface temperature of the viewing glass is safe to touch and the surrounding façade materials do not damage from excess heat transfer from the viewing window.

To ensure the window is not damaged in transit, it is packed separately to the oven. The diagram below illustrates how the viewing window is fitted into the oven.

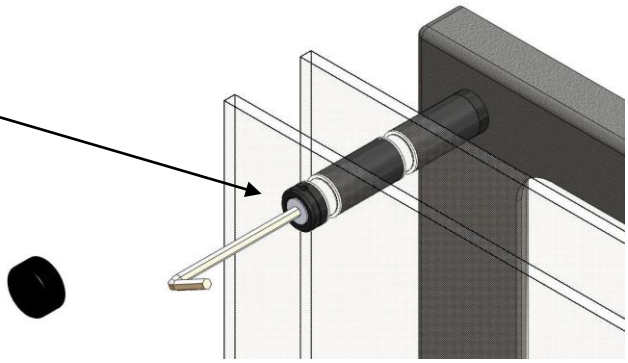
NOTE: *Be careful not to damage the edge of the glass on the steel frame of the window.*

Once unpacked, the outer glass assembly needs to be removed from the window.

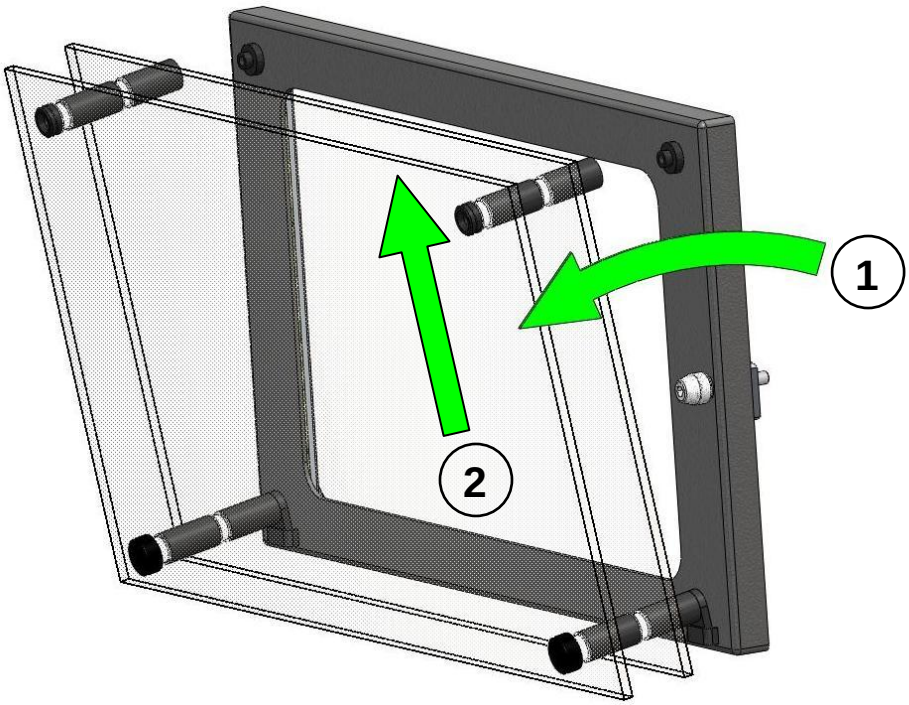
Remove the top 2 plastic caps ONLY.
Do **NOT** remove the bottom 2!

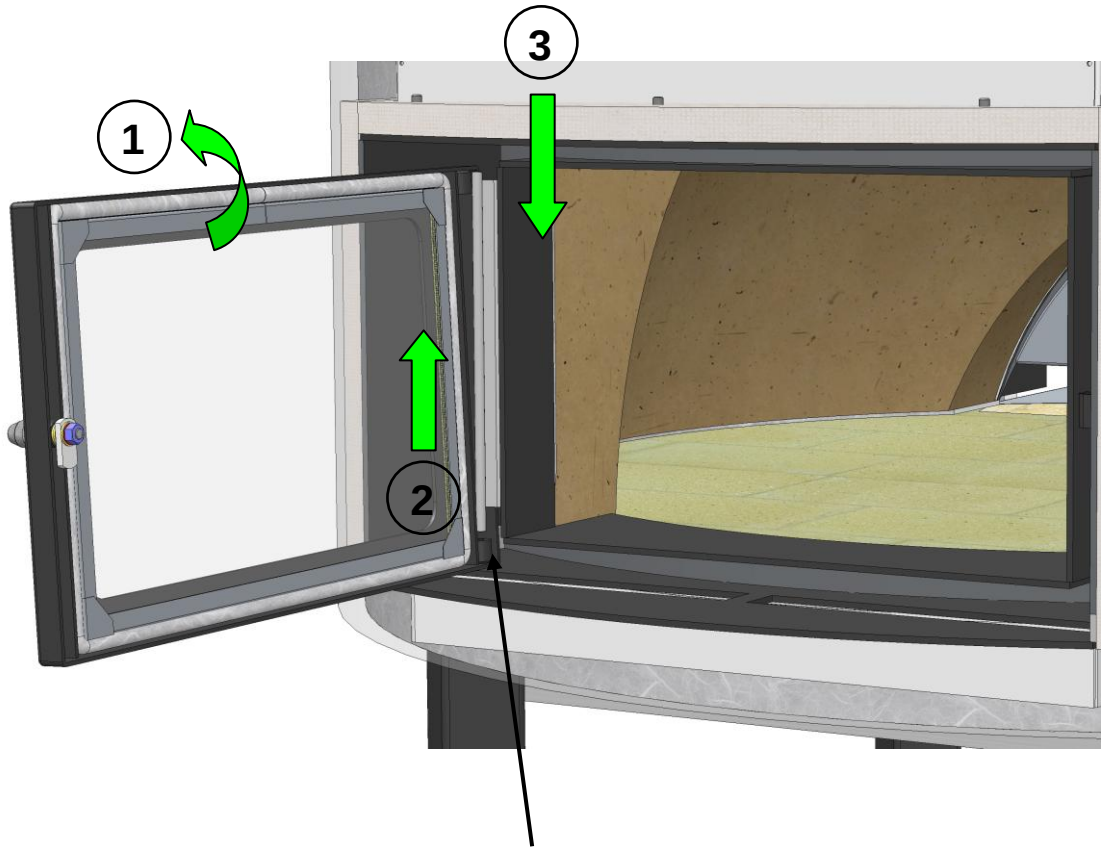


Remove the top 2 screws using a 4mm hex key.
NOTE: Hold the glass in place so it doesn't fall outwards.



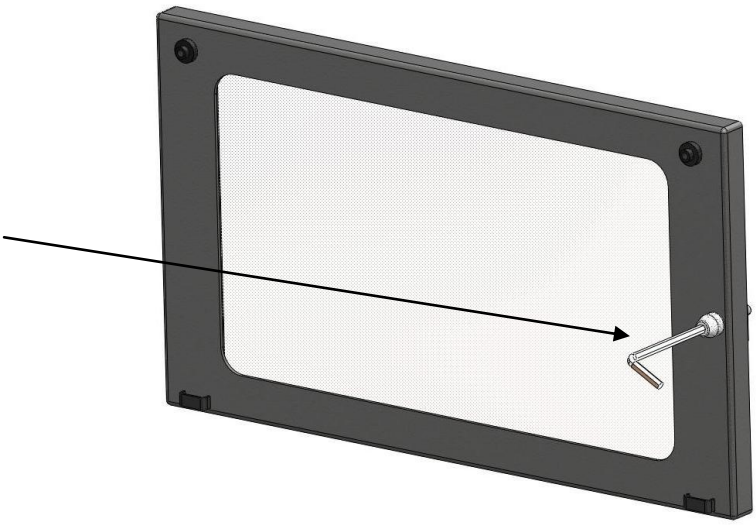
Carefully lean the top of the outer glass assembly forward (1) and lift so the lugs on the bottom release (2).





Tilt the window out slightly at the top enough to allow the bottom hinge cylinder to slip over the bottom of the hinge rod.
Lift and tilt back and let the top hinge cylinder slip over the top of the hinge rod.

Close the door and lock with a 6mm hex key.



Remove the hex key and re-fit the outer glass assembly in reverse order.

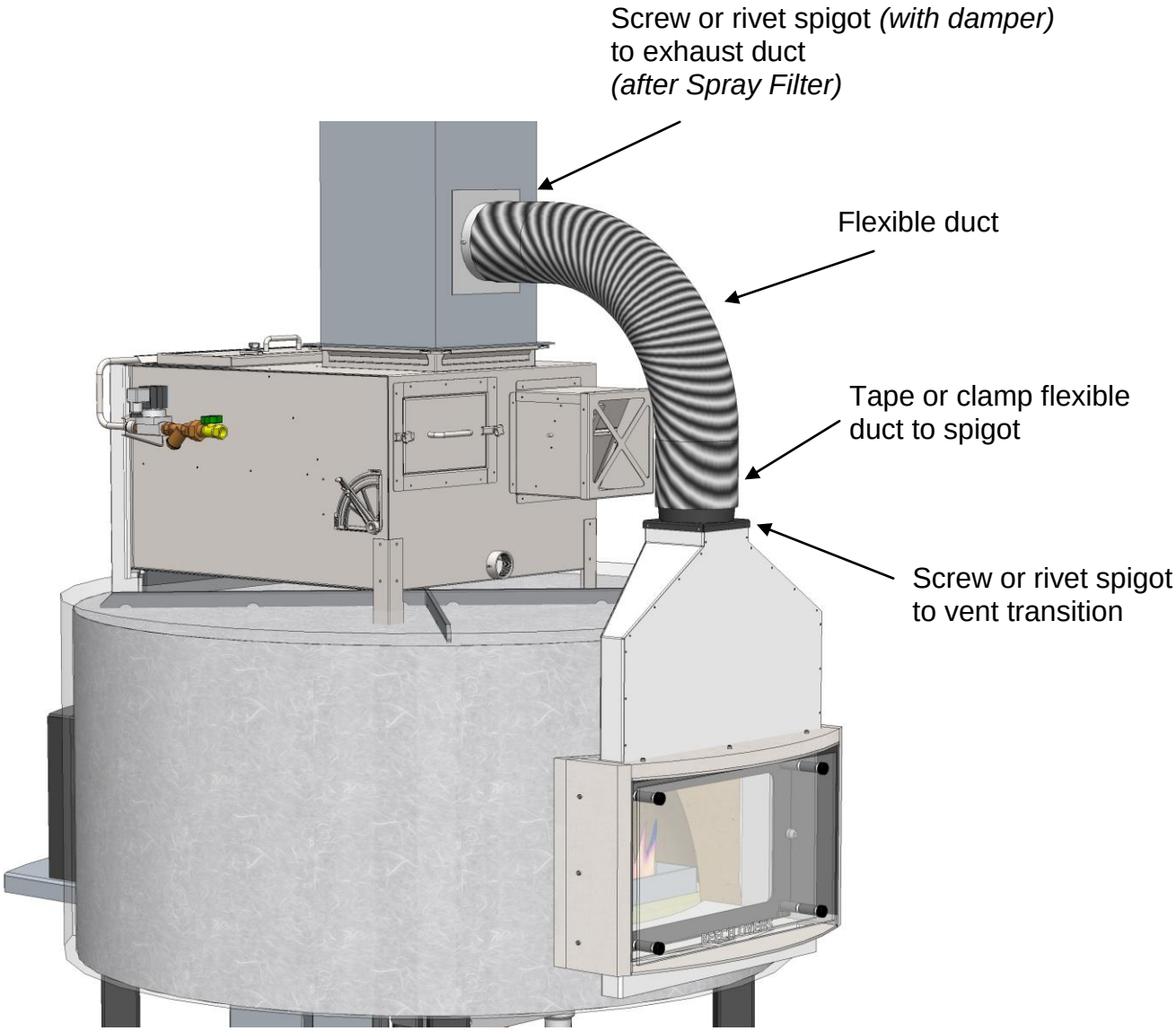
NOTE: *Ensure that the plastic caps are fitted as the steel section will become very hot during use.*

Most windows will need to be trimmed to the façade wall. Ensure that the trims do not cover the vent slots in the top and bottom of the window frame. The slots are to allow cool air to circulate past the glass to keep it cool.

Window Vent Connection

All viewing windows are now delivered with a window vent transition, 2 x duct spigots and flexible duct which should be connected to the exhaust duct. For those installations using a Spray Filter, this connection should be made at least 200mm after the Spray Filter.

The diagram below outlines the window vent correctly connected.

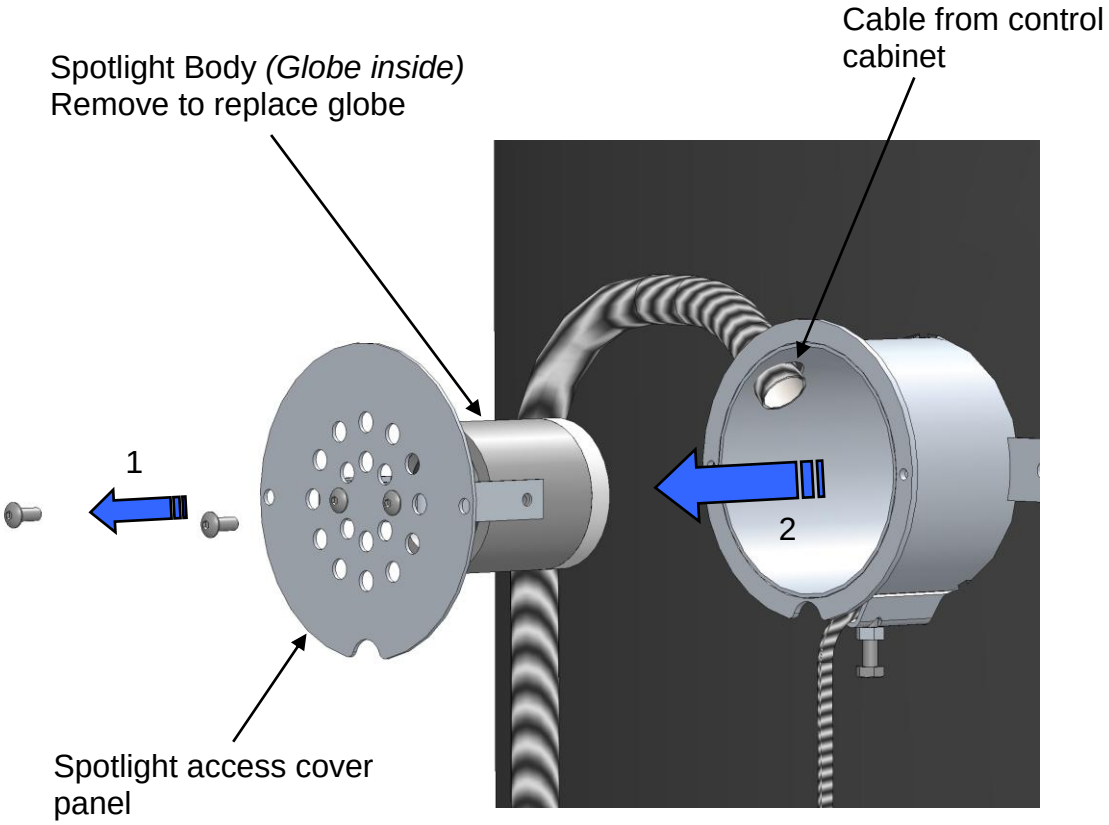

Screw or rivet spigot *(with damper)* to exhaust duct *(after Spray Filter)*
Flexible duct
Tape or clamp flexible duct to spigot
Screw or rivet spigot to vent transition

Spotlight Connection

For those ovens fitted with a spotlight, there will be a cable from the main control cabinet that must be connected in order for the spotlight to function. The cable will be coiled on the back of the control cabinet and provision for running the cable *(clamps and holes cut in oven body where required)* to the spotlight fitting has already been made.

All installation and connection of electrical cabling should be carried out by a licensed electrician.

NOTE: Ensure adequate access is provided in the oven façade to allow access to the spotlight cover panel for future service and maintenance. Without external access, the glass and spotlight globe cannot be replaced.



Electrical Connection

The system will require the following earthed mains electricity supply;

- 220-240 Volt *(other voltages available by request)*
- 50Hz
- 10 Amp

Within the Gas cabinet a power supply cable is supplied connected to an Australian standard plug. Should your oven be installed outside of Australia, a common practice is to purchase an adapter to suit your local socket configuration.

In some instances a new plug may be fitted to suit your local socket configuration, or you may wish to hard-wire your system to an isolator. If these methods are used, ensure to adhere to the following instruction.

NOTE: Power supply to the system is **polarity sensitive**. The following colour codes **MUST** be adhered to for your system to operate.

- Brown = Active / Live
- Blue = Neutral / Common
- Green = Earth

Final Checks

1. Check all gas, mechanical and electrical connections to all equipment. Ensure that the burner and shroud are firmly located.

2. Check gas flow logic, opening all relevant manual valves.

3. Proceed with start up procedure outlined in the Commissioning section of this manual.

Installation Checklist

When the initial installation is complete, please read through the following checklist to make sure the oven is safe for commissioning.

- ☐ Legs fastened sufficiently to floor (if applicable) – oven is stable in position. *(Refer to **Assembly**)*
- ☐ Outer ceramic wool insulation complete and well fastened. *(Refer to **Assembly**)*
- ☐ 25mm Air Circulation Gap evident. *(Refer to **Assembly**)*
- ☐ Gas control cabinet and Burner(s) mounted firmly in position. *(Refer to **Connection Procedures**)*
- ☐ Shrouds firmly in place. *(Refer to **Connection Procedures**)*
- ☐ All Gas fittings tight and correctly connected. *(Refer to **Connection Procedures**)*
- ☐ All electrical components correctly installed – Mains Electricity Supply sufficient earthed and in accordance with local regulation. *(Refer to **Electrical Installation**)*
- ☐ Check that the Exhaust Duct installation is compliant with local regulation. *(Refer to **Exhaust Duct Design**)*
- ☐ For those systems fitted with a Spray Filter, check that all water, drain and electrical connections are correct and complete. *(Refer to **Flue Connection – Spray Filter**)*
- ☐ Check that there is sufficient access and ventilation both below and above the Oven for maintenance and inspection. *(Refer to **Venting the Oven**)*
- ☐ If applicable, check that the Stainless Steel Hearth is fitted correctly, level with the floor bricks. *(Refer to **Stainless Steel Hearth**)*
- ☐ Check that all wiring and cabling is routed correctly. *(Refer to relevant component)*
- ☐ Check that the area below and surrounding the oven is clean, tidy and free of debris.
- ☐ **Ensure that ONLY non-combustible materials are used in the construction of any façade surrounding the oven, including the areas closest to the oven steelwork, e.g. doors and windows. Refer to the Oven Façade Guide – available from Beech Ovens Head Office.**
- ☐ **Check to ensure that suitable fire extinguishing equipment is close at hand.**

Section 2 - Commissioning

Commissioning

Commissioning

The gas system is fully automatic and when switched to **ON** sends a high voltage spark to the gas burner head. It continues to spark for 6-10 seconds. The flame will light automatically, heating up the oven space on high flame, then drop to low flame once set point temperature (SV) is reached.

*(If the burner does not ignite in 6-10 seconds, the system stops sparking for flame failure protection. The white **FAULT/ RESET** button will light. Press the white **FAULT/ RESET** button for successive attempts. Several attempts may be required for initial purging of the gas line.)*

As part of connection, the Gas supply lines are to be purged of any air that may be in the pipes. *(Refer to the **Connection** section in this manual.)*

The following steps are used **ONLY** to check the ovens general function. Before the oven may be used for cooking it must undergo a Preheat stage. *(Refer to the **Preheating** section in this manual)*

1. Turn the main control switch to **CONTROL**.

   The Digital Temperature controller will self check then display the current oven temperature (PV).

2. Set the set point temperature (SV) to 100°C. *(Refer to **Digital Temperature Controller** section in this manual.)*

3. Turn the main control switch to **ON**.

   (Listen for the spark) The burner(s) should now ignite.

   *If the burner fails to light, the white **FAULT/ RESET** button will light. To reset the ignition process, press the white **FAULT/ RESET** button.*

   Should the burner fail to ignite after four (4) attempts, checks should be made by using the troubleshooting guide in this manual.

4. The gas system can be turned off by turning the main control switch to **OFF**.

   *Before Preheating, refer to the following section **System Damper Calibration**.*

System Damper Calibration

For those ovens supplied with either a Flue Transition or a Spray Filter from Beech Ovens, an integrated System Damper is fitted. Correct adjustment of the System Damper is an extremely important part of commissioning to ensure oven efficiency and safe operation.

The following section explains the relevant variables in flue suction levels and the methods used to correctly calibrate the System Damper.

Oven Draw *(Suction)* variables

The amount of suction is affected by the following;

- Relative pressure of the restaurant/kitchen area which is affected by whether there is fresh air inlet for air-conditioning, open windows, doors, ceiling voids, nearby extraction canopies, vents or other factors which may give different pressure regions about the oven and flue system.
- Whether the restaurant/kitchen is open air and if so the effect of wind on the oven.
- Whether the exhaust is affected by prevailing winds.
- The specific geometric layout of the duct work.

The quantity of suction depends on the design of the exhaust system. There are a number of options:

Exhaust Design	Air Flow
Natural Draft	~ 150 litres/ second
Forced Draft (fan) with cool air inlet *(Door 1)*	~ 700 litres/ second
Additional Doors Including Char Grill *(per door)*	~ 300 litres/ second
Exhaust Canopy	As per manufacturers specifications

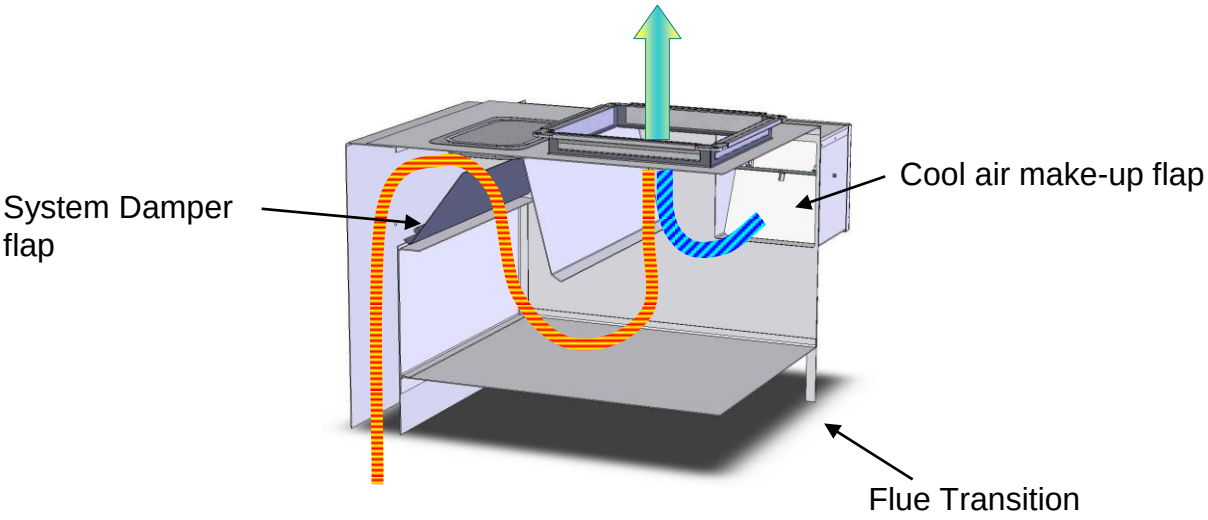
The above airflow rates are indicative only for fan sizing and calculation of duct air flow requirements. Static pressure of 130Pa within the duct is required.

Cool Air Make-up check

It is strongly recommended that the cool air make-up device *(Barometric Controller)* have access to well ventilated fresh air, preferably an outside air source. ***Consult your mechanical service consultant to design supply.*** This is done to eliminate the possibility of the cool air make-up device drawing air from the underside of the oven causing a negative pressure in the oven cavity. This can result in flame failure and/or reduced oven efficiency.

Before calibrating the flue, check that the cool air make-up device functions properly. It is important to make sure that the flap can move freely and that it has not suffered any damage in transport or during the course of installation.

To check the cool air make-up device's function, close the System Damper fully and check that the cool air make-up flap opens to allow fresh air in. When the fan is switched off, the cool air make-up flap should then close. This may have a delayed reaction.



NOTE: Before preparing to calibrate the System Damper, ensure that all the variables that will effect the oven such as air-conditioning, windows and doors and all ancillary exhaust devices are either on or as they would be during normal operation. This is to ensure that the calibration will be true when the oven is in full operation in conjunction with other equipment.

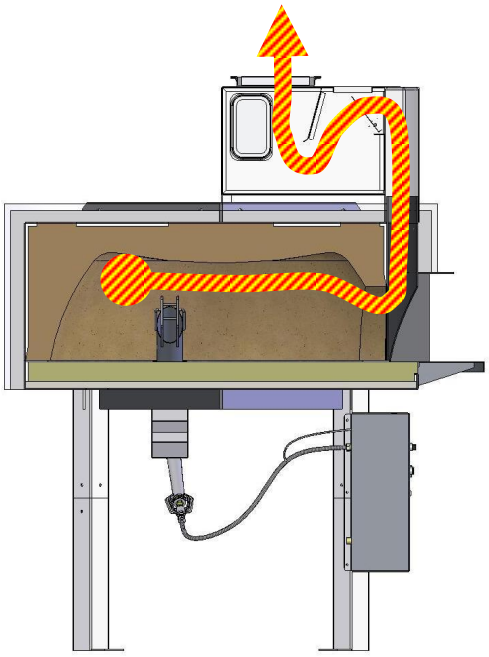
The A4 Paper Test

Without access to suitable measuring equipment, the most effective method to correctly calibrate the oven exhaust is using the A4 Paper Test as explained below.

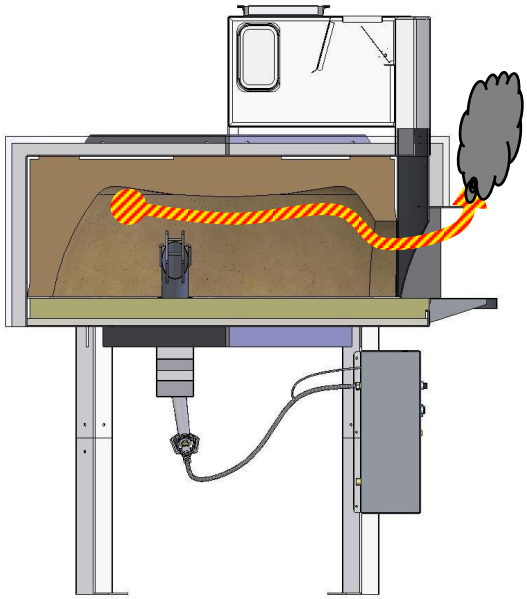
The A4 paper test has been developed to be a simple and effective gauge to determine the draw *(suction)* at the oven exhaust spigot *(top of the oven mouth).* This is a common and often overlooked cause of poor oven performance.

Too much suction causes the oven to lose heat & use excessive fuel. Too little suction allows smoke and combustion gas to escape into the kitchen. There is a fine balance between too much and too little. To adjust the draw, you will need to access the System Damper quadrant adjuster installed in the Flue transition or Spray Filter connected to the oven spigot.

Too much draw (suction)

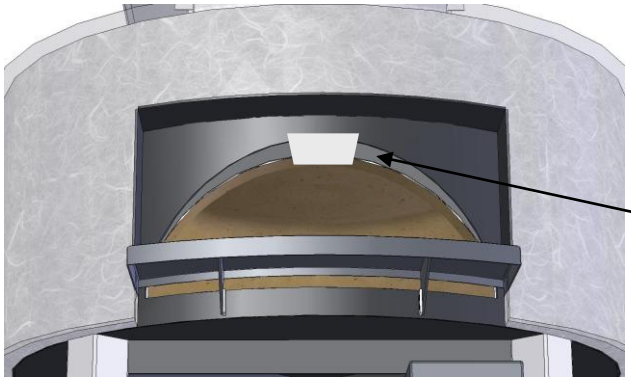


Not enough draw (suction)



For Australian installations using the Interlock System *(AS5601)* the Flue temperature can be adjusted using the System Damper to achieve a PV *(Interlock)* of 130°C -150°C (max) when the oven is fully heated.

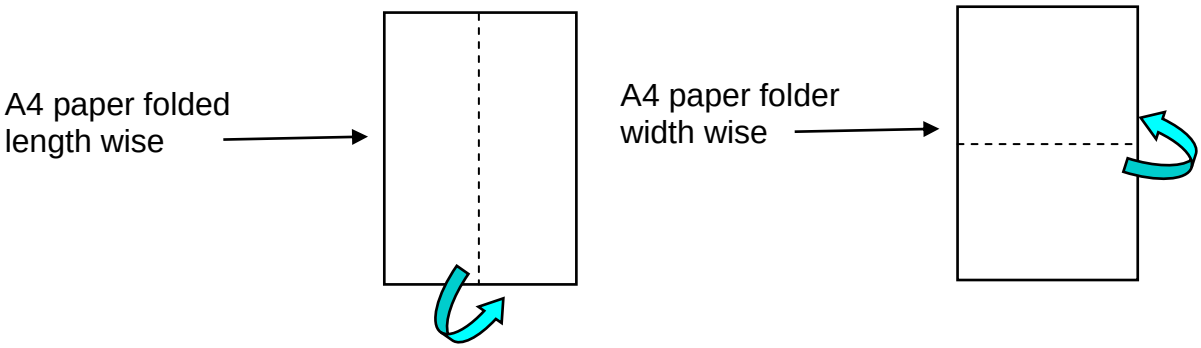
For all other systems, it is advisable to check the exhaust spigot temperature when the oven is fully heated and operational. Adjust the damper to obtain 130°C -150°C.



Exhaust spigot with paper folded width wise held in position.
(RND1300 Round oven)

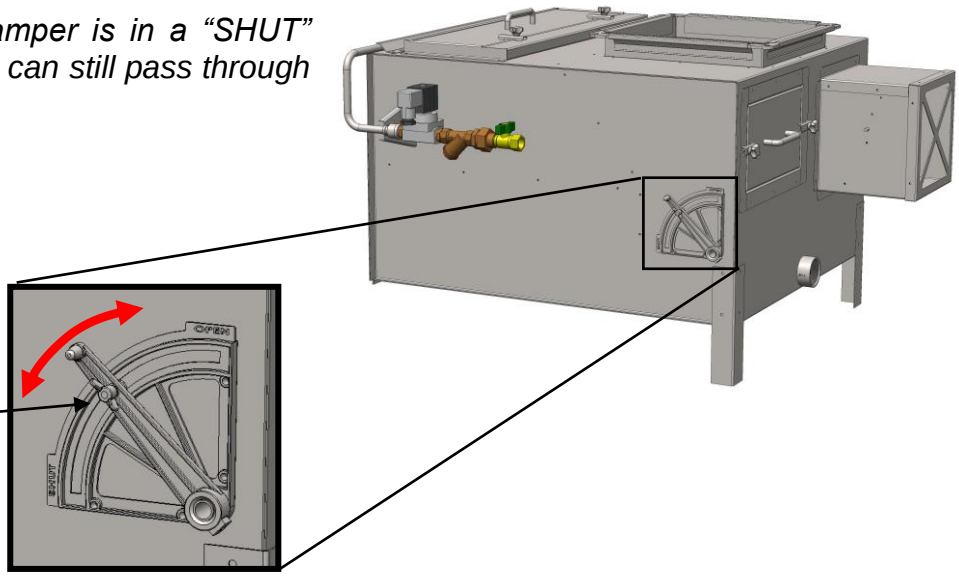
With the exhaust fan running, the suction at the exhaust spigot at the mouth of the oven should be enough to hold a sheet of A4 paper folded in half width wise. However, the suction should **NOT** be so much that it will hold the A4 paper when folded lengthwise.

NOTE: *It is acceptable to use either A4 or Letter size paper.*



If the sheet falls from position the System Damper will need to be adjusted *(opened slightly)* to increase the airflow.

NOTE: *When the System Damper is in a "SHUT" position, a small amount of air can still pass through the damper.*



To adjust, loosen wing nut and move the quadrant adjuster until correct required air flow is achieved.

With the A4 sheet folded lengthwise the suction should not be able to hold the paper in position at the flue spigot at the mouth of the oven. If the sheet stays in position the System damper will need to be adjusted *(closed slightly)* to decrease the airflow.

In the case of multi door ovens or ovens fitted with a char grill, repeat these instructions for all doors. *(For ovens fitted with a Char Grill, suction is automatically biased to the Char Grill side of the exhaust spigot)*

Careful work here will increase performance and help to resolve problems otherwise overlooked. Remember, too much suction removes great amounts of heat from this style of oven. Correct calibration is critical.

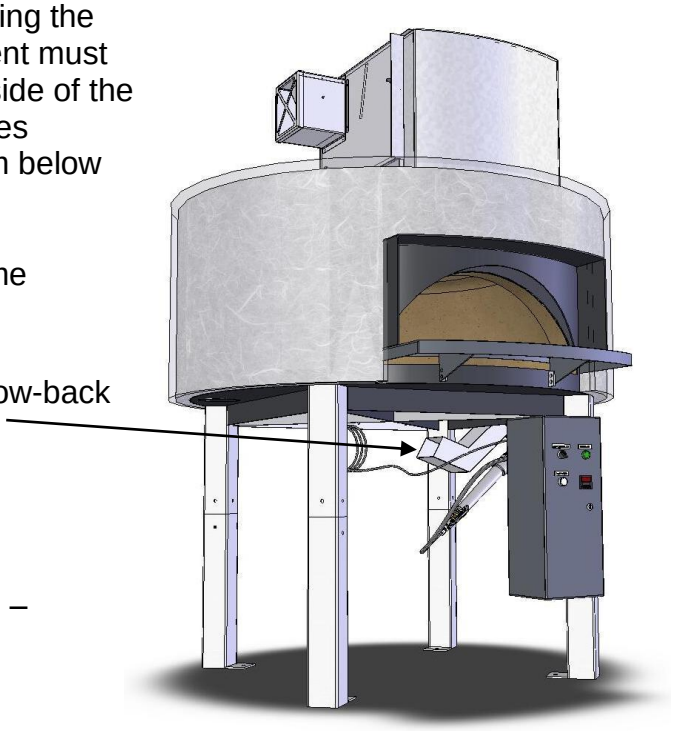
This test is simple and approximate. Additional calibration may be required should spillage be observed or if the exhaust spigot temperature exceeds the recommended 130-150°C (max).

If you have any questions, contact Beech Ovens Technical Support. technical@beechovens.com.au

Ventilation Test

As mentioned in the earlier section Venting the Oven, for all ovens with gas, an open vent must **always** be made available to the underside of the oven. To sustain a flame, the oven utilizes primary and secondary air (*oxygen*) from below the oven floor.

When firing the oven with gas, if the flame burns erratically check that the flame is not being drawn under the oven and leaking from the blow-back chute.



If flames are visible here, this means there is an ambient pressure imbalance. *(Higher pressure in the oven – Lower pressure below the oven)*

If smoke or flames are visible during the Ventilation test, shut the system immediately and refer to the section Ventilation Requirement.

System Balancing

Having checked that the oven is correctly vented and that the Flue is correctly calibrated, in some cases there may be external air pressure differences that can affect the performance of the oven.

In some instances an imbalance may occur between the space above the oven and the space below the oven. This may result in air being drawn from within the oven to compensate for this imbalance.

A direct result of this may be that the flame, or smoke, is being drawn under the oven causing the flame to behave erratically and the ovens performance deteriorates.

In most cases this is due to two (2) possible causes:

- Insufficient ventilation below the oven

  *In the case of insufficient ventilation below the oven, refer to **Ventilation Requirement** in this manual.*

- Excessive draw from above the oven

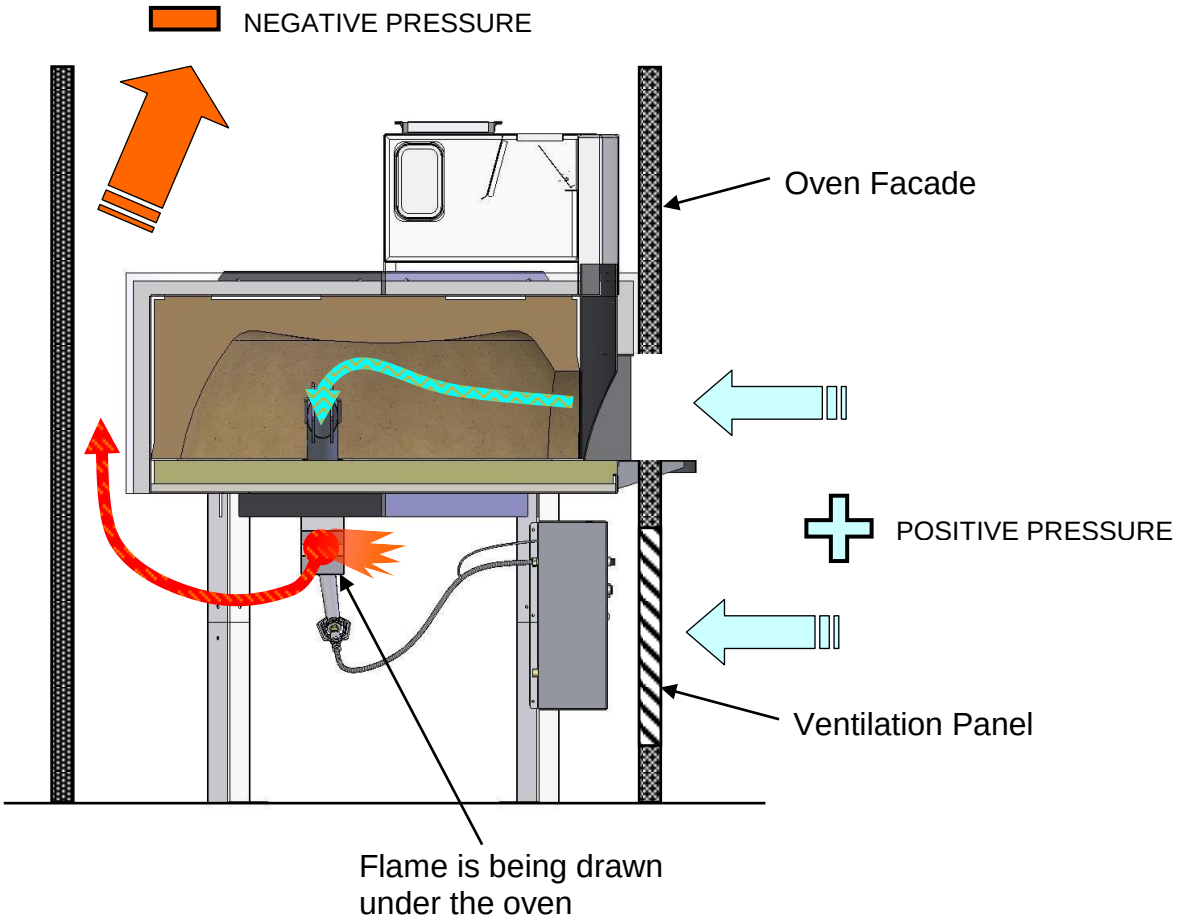
  If there is excessive draw from above the oven, this may result in the ventilation below the oven being insufficient.

  In worst case scenarios it may be required that the base of the oven be sealed off to prevent any air being drawn from within the oven cavity resulting in the flame being drawn under the oven.

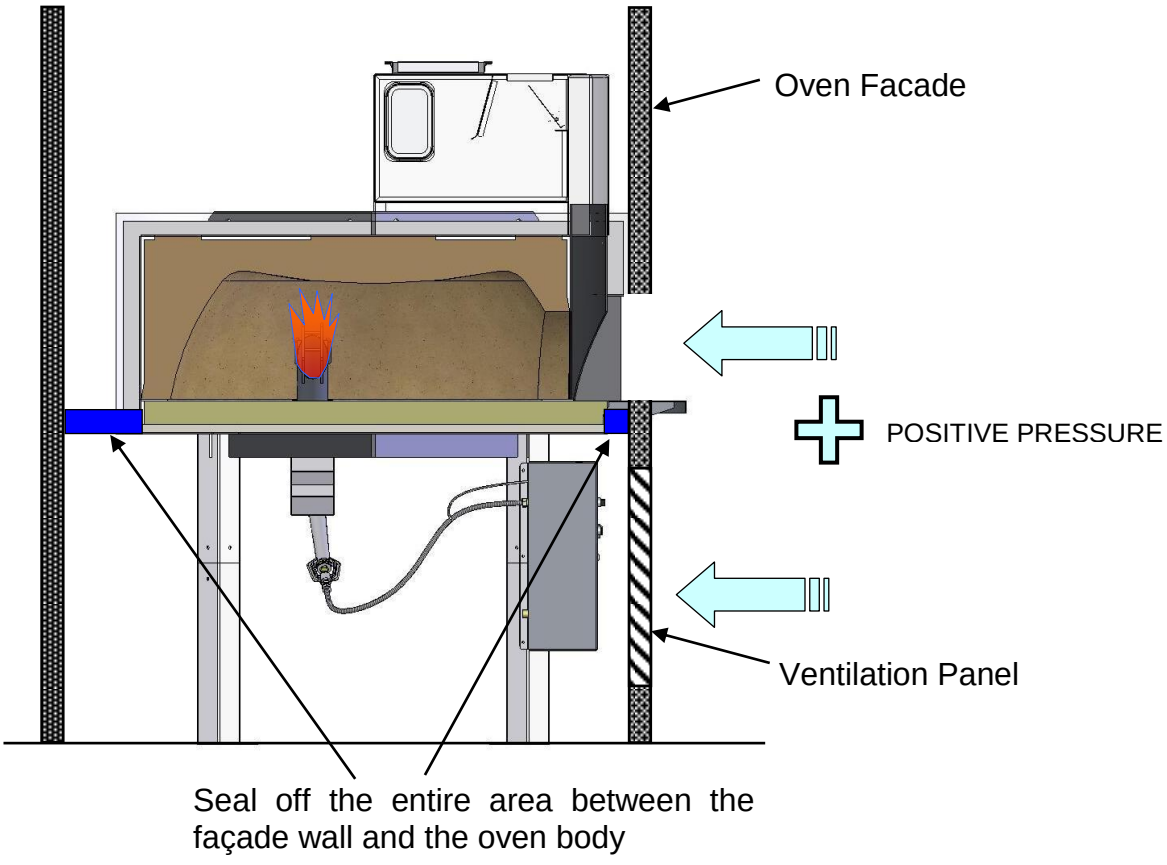
  The following diagrams explains excessive draw from above the oven and the most common solution to this issue.

For further assistance refer to the technical assistance section on www.beechovens.com or contact Beech Ovens Technical support. technical@beechovens.com.au

Problem:



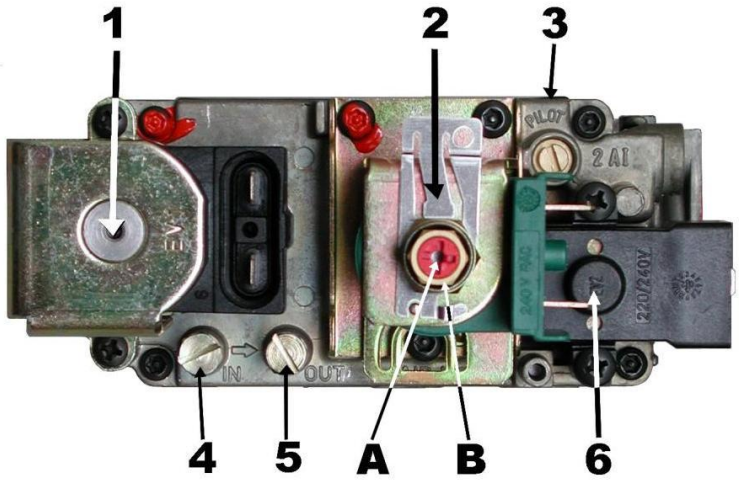
Solution:



Flame Calibration – Sit Nova 826

The following section explains the calibration procedure for the Sit Nova 826 Combination Gas valve. The valve allows for use with both Propane and Natural gas, however the jet in the burner will need to be changed and the data plate updated when converting gas types. Conversion kits are available to purchase from Beech Ovens Head Office (sales@beechovens.com.au) or your local Beech Ovens representative.

Note: *Never attempt to convert gas types without first changing the burner jet and data plate in the Gas control cabinet.*



1 On-off solenoid valve Ev1

2 Gas pressure modulating device

A Low fire pressure adjustment

B High fire pressure adjustment

3 Pilot screw (not used)

4 Inlet pressure test point

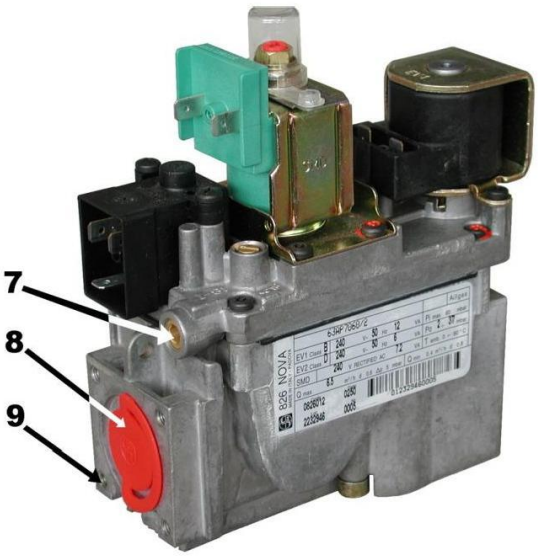
5 Outlet pressure test point

6 On-off solenoid valve Ev2

7 Pilot outlet (not used in this oven)

8 Main gas outlet

9 Holes (M5) for fixing flanges



The calibration procedure is identical for Propane and Natural gas systems, though the reader must refer to the General Technical Details chart for adjusted pressure requirements.

Note: *This calibration procedure should be carried out by an experienced gas technician and is performed in situ with the system fully operational.*

It is very important to follow these instructions to set up the Combination Gas valve to achieve maximum performance. Each installation will vary and although the factory setting will produce a flame, it is necessary to fine tune the valve settings. This is standard practice for most gas appliances on installation.

For ovens using Natural Gas, the burner will *(in most cases)* have been jetted at the factory to produce 80MJ with a supply pressure *(outlet pressure)* of 1kPa. *(Refer to data plate inside the Gas control cabinet for oven specific details.)* This is the High Flame setting. The Low Flame setting is set to a lower pressure after the High Flame setting has been adjusted. When this has been done it is necessary to re-check the High Flame setting.

Before going further, you should familiarize yourself with the Sit Nova 826 Combination Gas valve to be aware of the location of the test and adjustment points.
(Refer to the identification diagram above.)

Setting High and Low Flame Pressure

Before calibration, check that all other kitchen appliances connected to the main Gas supply line are running at maximum capacity. If flame calibration of the oven is done independently of other appliances being in use, the following steps will need to be repeated when these appliances are running to ensure the main Gas supply is capable of the supplying the required flow.

To begin adjustment, the main Gas supply pressure should first be checked on the inlet side of the valve to confirm that sufficient pressure is being supplied.

The screw for the Inlet *(supply)* pressure test point *(4 in above diagram)* can be removed and an appropriate fitting or hose used to connect to the test gauge. This should confirm supply pressure in excess of the required pressure of 2.0kPa for Natural Gas and 2.75kPa for Propane Gas. Should supply pressure fall below these levels, gas supply to the kitchen will need to be improved.

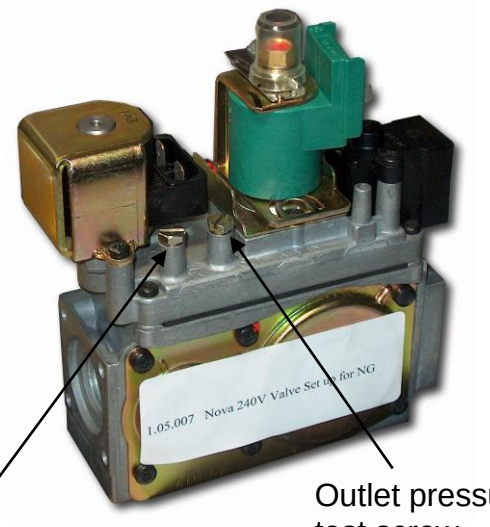
Note: *Supply pressure above 5.0kPa will damage the valve. If supply pressure is above 5.0kPa, a pressure regulator must be installed.*

Replace the inlet pressure test point screw and tighten to 2.5Nm.

High Flame

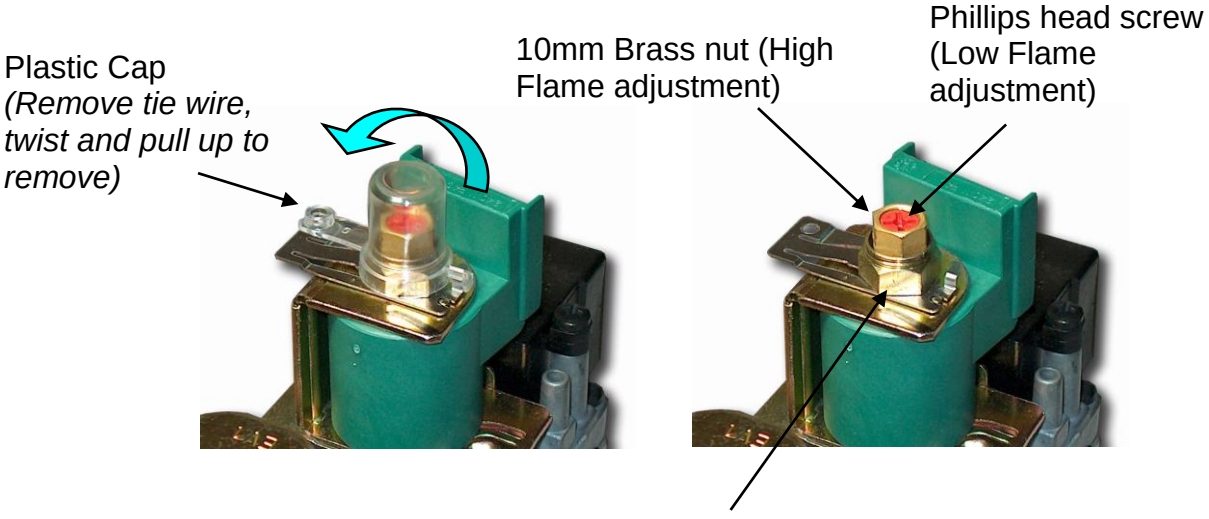
Confirm that the Digital Temperature controller on the front of the Gas Control cabinet door is set so that the set point temperature (SV) is at least 100°C greater than the present value temperature (PV). This procedure will ensure that the valve remains on High Flame while calibrating. *(Refer to **Digital Temperature Controller** for full instructions.)*

- Turn on/start the gas system. *(Refer to **Commissioning** for full instructions)*
- Remove the Outlet pressure test screw. Connect to the test gauge using an appropriate fitting or hose to check the High Flame pressure. The pressure should be 1kPa for Natural Gas and 2.75kPa for Propane Gas.



- If adjustment is required, remove the plastic cap covering the adjustment screw by first removing the tie wire, twisting counter-clockwise then pulling up. *(see below)*
- Using a 10mm spanner, adjust the brass nut clockwise to increase pressure and counter-clockwise to reduce pressure. *(see below)*

The Pressure Adjustment screws are as follows;


Plastic Cap
(Remove tie wire, twist and pull up to remove)
10mm Brass nut (High Flame adjustment)
Phillips head screw (Low Flame adjustment)
The lower brass hex nut is **NOT** for adjustment. Do **NOT** loosen.

Low Flame

When the correct pressure is achieved for High Flame, set the Digital Temperature controller so that the set point temperature (SV) is 12°C below the current oven temperature (PV). This will cause the Combination Gas valve to switch to Low Flame mode.

The Low Flame pressure setting can now be set to a recommended pressure of 0.375kPa for Natural Gas and 0.75kPa for Propane Gas.

- Hold the position of the Brass nut in place with the 10mm spanner. With a No:1 Phillips head *(star)* screwdriver, adjust the Phillips head screw clockwise to increase pressure and counter-clockwise to reduce pressure. *(see above)*

- If it is found that the recommended setting is not functioning as desired, Low Flame can be adjusted with the help of an observer to regulate the flame to a satisfactory size. *(This may be the case with multi-burner ovens, though the recommended minimum pressures remain 0.375kPa for Natural Gas and 0.75kPa for Propane Gas.*

- Re-check the High Flame settings as outlined in **High Flame**.

- When the settings are correct replace the Plastic cover.

- Remove test gauge fitting *(hose),* replace the outlet pressure test point screw and tighten to 2.5Nm.

- Reset the Digital Temperature controller's set point temperature (SV) to the required temperature. *(Refer to **Digital Temperature Controller** for full instructions.)*

Flame Calibration - Char Grill

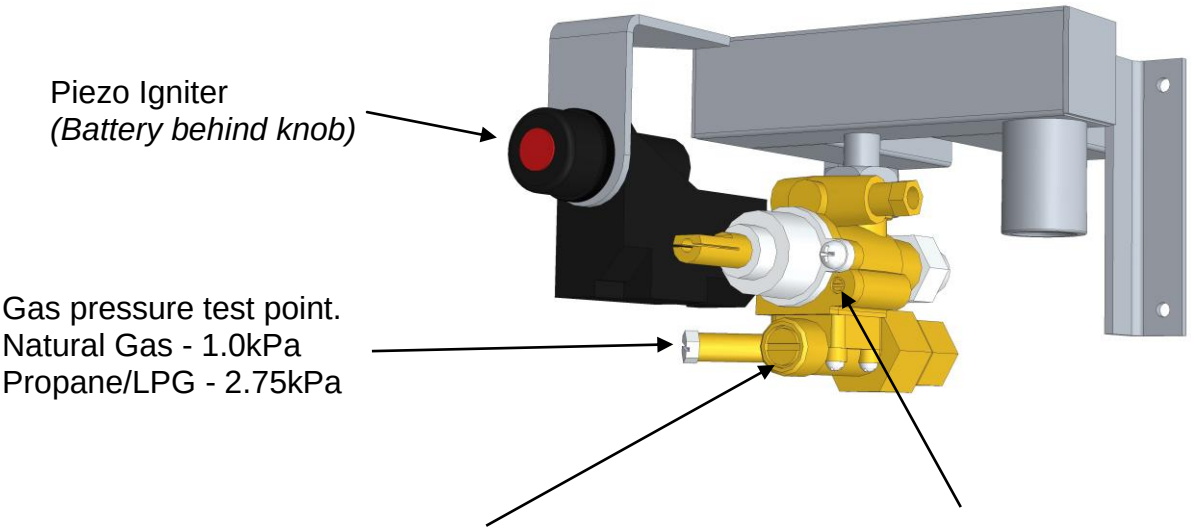
The procedure for calibrating the Char Grill flame is outlined below.

Note: *This calibration procedure should be carried out by an experienced gas technician and is performed in situ with the system fully operational.*

Before calibration, check that all other kitchen appliances connected to the main Gas supply line are running at maximum capacity. If flame calibration of the Char Grill is done independently of other appliances being in use, the following steps will need to be repeated when these appliances are running to ensure the main Gas supply is capable of the supplying the required flow.

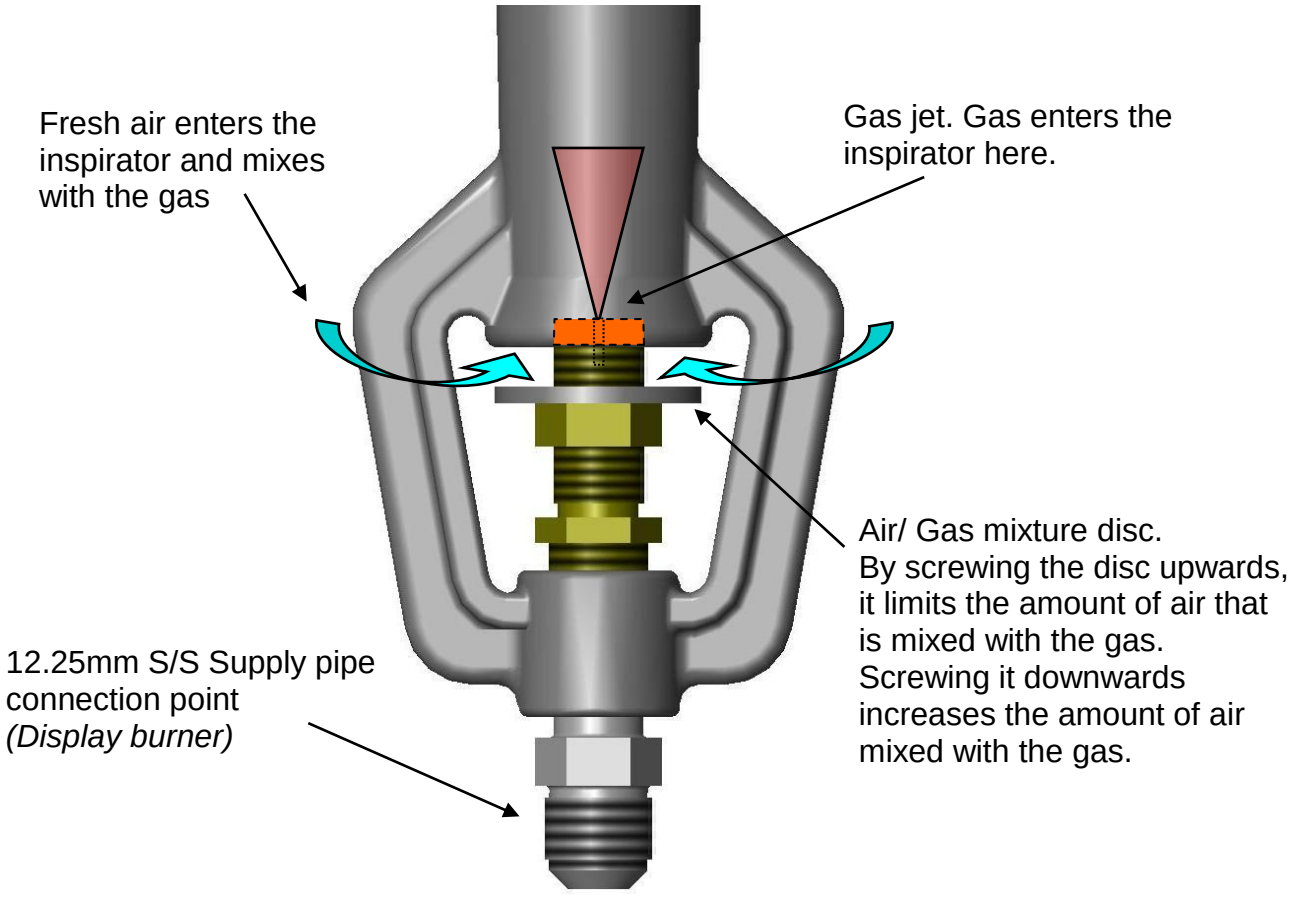
To begin adjustment, the main Gas supply pressure should first be checked on the inlet side of the valve to confirm that sufficient pressure is being supplied.

- Remove the control knob from the Gas control valve. This is a 'press fit' type knob.
- Connect a Gas pressure gauge to the test point as shown below. Test for incoming gas pressures as listed below. *(For Natural Gas, adjust incoming pressure at supply regulator prior to Gas control valve)*
- With the correct pressure at the control valve, proceed to check the High and Low Flame settings, using the relative adjustment screws as shown below.
- When the correct flame settings are calibrated, remove the test gauge and replace control knob.


Piezo Igniter
(Battery behind knob)
Gas pressure test point.
Natural Gas - 1.0kPa
Propane/LPG - 2.75kPa
'High Flame' adjustment screw. Max flow when screw is 2mm below top of hole. Screw in (clockwise) to decrease pressure (flame size).
'Low Flame' adjustment screw. Screw in to decrease low flame setting. (Maintain strong flame setting)

Inspirator Calibration

The main function of the inspirator is to allow fresh air to mix with the gas before it enters the nozzle of the burner. The amount of air that is mixed with the gas governs how the flame will burn. The correct adjustment of the air/gas mixture is critical to achieving a suitable flame.


Fresh air enters the inspirator and mixes with the gas
Gas jet. Gas enters the inspirator here.
Air/ Gas mixture disc.
By screwing the disc upwards, it limits the amount of air that is mixed with the gas.
Screwing it downwards increases the amount of air mixed with the gas.
12.25mm S/S Supply pipe connection point
(Display burner)

After Preheating is completed, adjust the Air/ Gas disc on the inspirator to achieve the following flame characteristics:

- For the Tube burner, the flame should reach the roof of the oven.
- For Natural Gas, all flames should be blue at the base with light yellow tails,
- For Propane or LPG, the flame will be mostly light yellow. The Air/ Gas mixture disc will need to be nearly fully open for Propane. (*Deep yellow to orange is **NOT** correct and will deposit soot on the roof of the oven.)*

Please direct gas technical questions to the Beech Ovens Technical Support team in Australia at: technical@beechovens.com.au

Refer to the following ***Commissioning Checklist*** *before firing the oven for the first time.*

NOTE: *Before the oven can be used for normal use, the Oven must undergo a Preheat stage. For Preheat instructions, refer to* ***Preheating with Gas*** *or* ***Preheating with Wood****.*

Installation & Commissioning Check Sheet

Please complete and return to Beech Ovens after commissioning.
Failure to return to this form may void the warranty of the oven.
A signed copy must remain with site personnel.

Commissioning Technician: _____ Date: _____

Installation Contractor: _____

Install Date: _____

Model: _____

Serial Number: _____

Customer Name *(Executive Chef/ Hotel Engineer/ etc):* _____

Installation Address: _____

_____

_____

Phone: _____

Email: _____

Beech Ovens contact information

Beech Ovens Head Office:
36 Gladys St
Stones Corner
Brisbane Qld 4120
Australia

Tel: +61 (0)7 3397 0277
Fax: +61 (0)7 3397 0030

Web: www.beechovens.com
E-mail: sales@beechovens.com.au
Technical Support: technical@beechovens.com.au

Postal Address:
PO Box 1577
Coorparoo DC 4151
Brisbane, Australia

Installation Check Sheet

Assembly Check:

□ Flue System. □ Fitted Oven Components. □ Access above and below oven.

- **Ensure that ONLY non-combustible materials are used in the construction of any façade surrounding the oven, including the areas closest to the oven steelwork, e.g. doors and windows.**

Exhaust Type:

- Check that the Exhaust Duct installation is compliant with local regulation.
- Spray Filter. □ Flue Transition. □ Canopy. □Other: _____
  - *(Spray Filter)* Water connected.
  - *(Spray Filter)* 40mm Drain connected.
  - *(Spray Filter)* Power connected and linked to Exhaust fan circuit.

Gas Connection:

- All Gas fittings tight and correctly connected.
- Gas control cabinet and Burner(s) mounted firmly in position.
- Shrouds firmly in place.
- Gas Type corresponds to that stated on the Data plate located in the Gas control cabinet.
- Burner connected to Gas control cabinet.
- For Dual burners – Tube burner connected to “Burner 1” connection on Gas control cabinet.

Electrical Connection:

- Check that all wiring and cabling is routed correctly.
- All electrical components correctly installed – Mains Electricity Supply sufficient earthed and in accordance with local regulation.
- Correct Polarity
  (Power (Live) = Brown Neutral = Blue Earth = Green)
- Tri-Electrode connections and corresponding cabling is correctly fitted. *(All burners: Zones 1 & 2)*
  - Spark evident.

General Installation Check:

- Legs fastened sufficiently to floor (if applicable) – oven is stable in position.
- Outer ceramic wool insulation complete and well fastened.
- 25mm Air Circulation Gap evident.
- If applicable, check that the Stainless Steel Hearth is fitted correctly, level with the floor bricks.
- Check that the area below and surrounding the oven is clean, tidy and free of debris.
- **Check to ensure that suitable fire extinguishing equipment is close at hand.**

Commissioning Check Sheet

Electrical and Water supply:

- Power supply to Gas control cabinet is connected and turned on.
- If the exhaust system is fan forced, ensure that the fan is running and rotating the correct direction. Check for suction *(draw)* at oven spigot.
- Where applicable, check that the Spray Filter is correctly installed and functioning correctly.
  - *(Spray Filter)* Water connected and on.
  - *(Spray Filter)* Power connected and on.
  - *(Spray Filter)* Water present at Tundish when operational.

Gas Pressures:

- All relevant Gas supply is correctly connected to the Gas control cabinet, the flexible gas tube is connected securely to the correct burner and the manual valves are open *(On).* Check for leaks.
- Check gas pressures with all burners operating and at least 80% of all gas appliances in kitchen operating.
- Check the Flame size and colour to make sure the correct gas pressures are calibrated.
  - Check High and Low Flame settings on all burners.
- Check that the Inspirator(s) is correctly calibrated to give the correct flame colour and size.

General Commissioning check:

- *(Australia Only)* Check Interlock Thermocouple is correctly installed and functioning correctly.
- Check that the flue is installed and compliant with local regulation.
- Check that there is sufficient ventilation below the oven.
- Check that the Thermocouple is fitted correctly, flush with the oven base.
- Check that the System Damper is calibrated correctly and sufficient balance is achieved in the flue.
- Check that all areas are clean and tidy both below and above the oven. Remove any debris from oven area.
- Check the Cool Air Make-up device function.
  - Cool Air Make-up connected to outside air source.

Operator Training:

- How to work the oven. □ Preheat instructions. □ Insert Plug Door correctly.
- Gas safety – How to isolate gas supply to the oven if the smell of gas is detected near the oven.
- Starting sequence – Check power/gas, Canopy/Fan on, Check heat-up.
- Digital Temperature controller operation.
- Maintenance and flue cleaning required 3/6 monthly. *(Maintenance schedule in Installation and Operation Manual outlined and explained)*
- Warranty card returned.
- Installation and Operation Manual has been received by the client.

Section 3 – Operation

Operation

Preheating with Gas

Before the oven can be used for cooking it must undergo a Preheat or curing stage. This is a gradual, low flame stage designed to thoroughly “warm” the oven prior to use. This is common practice for all ovens and must be done to ensure that the materials in the oven are slowly “cured” to reduce cracking. **The oven should be preheated for at least 72 hours.** ***(three (3) days)***

Once the oven has been commissioned and all installation work is complete, the oven is now ready for Preheating.

For ovens with two (2) burners, leave one (1) manual gas isolation valve closed.

To preheat the oven, turn the main control switch to **ON**.

While on High Flame, manually decrease the flame size to approximately half *(approx 150mm high)* by closing the manual gas isolation valve. This will allow a lesser amount of gas to burn, allowing a smaller flame.

Manual gas isolation valve in half open position.
Handle Vertical = **OPEN**
Handle Horizontal = **CLOSED**

With the settings in place from commissioning, the oven will now run continuously, automatically keeping the set point temperature (SV) at 100°C.

After day one (1) raise the set point temperature (SV) to 150°C.

After day two (2) raise the set point temperature (SV) to 200°C.

NOTE: *It is vital that only a small flame is used to preheat the oven. A large, fierce flame may crack the walls. Cracking can not be repaired, though will not effect the longevity or performance of the oven.*

Preheating with Wood

As mentioned in Preheating with Gas, before the oven can be used for cooking it must undergo a Preheat or curing stage. This is best done by making a fire just as you would build any fire for a barbeque. The best wood to use is anything hard, dry and dense which is untreated and without paint.

To start the fire follow the following steps:

1. Place a flattened cardboard box on the oven floor just inside the opening of the oven.

2. Scrunch up several sheets of newspaper and place them in the middle of the cardboard.

3. Place kindling *(small pieces of wood)* on the newspaper.

4. Place some larger pieces of wood on top of the kindling.

5. Light the newspaper.

6. Once the kindling is satisfactorily alight and the larger wood begins to burn, push the whole lot to the position in the oven where you will normally locate the fire. *(Either to the side or to the back of the oven)*

This fire of approximately 400mm diameter **should be kept going for at least 72 hours (*three (3) days)***, to thoroughly preheat the oven prior to first use. It is important to keep the temperature rise below 100°C per day.

After day one (1) raise the oven temperature to 150°C.

After day two (2) raise the oven temperature to 200°C.

NOTE: *It is vital that only a small fire is used to preheat the oven. A large, fierce fire may crack the walls. Cracking can not be repaired, though will not effect the longevity or performance of the oven.*

The purpose of this fire is to dry out the oven mortar slowly to reduce cracking.

Once this preheating is complete, you can operate the oven with just wood, just gas or a combination of both.

Adjustments for Normal use

After the three (3) days of preheating are completed, some adjustments must be made to allow the oven to function normally. The following section explains the adjustments required to set the oven for normal use.

- Return the manual gas isolation valve to fully open. Restriction of gas flow is no longer required.
- Reset the Digital Temperature control to the required temperature. *(Refer to **Digital Temperature controller** for instructions)*
- Read and understand the following section **Firing up to Cook**.

Ensure to retain this manual in a safe and accessible place. This manual is to be available for maintenance and kitchen personnel.

Firing up to Cook

From cold, allow the oven approximately 3 hours to heat up initially. Thereafter, warm up should take about 60 minutes, depending on the size of the oven. This time can be reduced by using gas.

The oven temperature is basically controlled by the size of the fire or the set point temperature (SV) of the gas system and the draft up into the flue system.

The flue suction should be sufficient to not allow smoke into the kitchen during normal operation. It is a fine balance. When firing with wood, the time of maximum smoke is at ignition time in the morning. *(To reduce the amount of smoke produced when lighting, dry the wood in the oven cavity overnight. Be sure to keep the wood clear of embers.)*

Optimum temperature for pizzas is approx 250-350°C. If pizzas do not cook in around five (5) minutes, the oven is too cool and a larger fire may be required*. Check the troubleshooting guide if a larger fire does not increase the temperature.*

The pizzas should be rotated and moved about to cook them evenly. The chef soon becomes familiar with the radiated and reflected heat properties of the oven and moves the pizzas around to suit these different heat zones.

Most restaurants place the pizza base directly on the oven floor although they can be placed on trays for time enough to toast the base a little before finishing off directly on the oven floor. Others leave the pizzas on trays for the whole process. This is a decision for the Executive Chef.

The oven can be used for cooking foods other than pizzas and many chefs experiment with different wood types to get interesting flavours. Food can be roasted in cooking trays and fried in black metal pans.

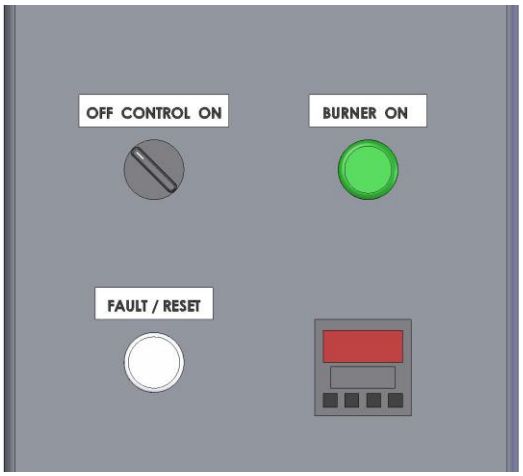
If required, we can arrange the services of an experienced Wood Fired Oven chef for training purposes.

For any enquiries please feel free to call or email Beech Oven's Head Office. sales@beechovens.com.au

Gas Control Cabinet Functions

Main Control Switch

The Main Control Switch has three positions:



OFF
Both temperature controller & burner are off in this position.

CONTROL
The temperature controller only is energized. In this position the temperature controller will read the current oven temperature (PV) and the set point temperature (SV). The current oven temperature (PV) is monitored at the stone hearth *(floor)* level. The actual oven temperature will be higher than indicated. This is useful if firing on timber to easily see the cooking temperature. This is a read out only and has no control over the oven temperature with the control switch in this position.

ON
In this position the oven will start automatically, cycling the gas system to maintain the preset temperature or set point temperature (SV) of the oven.
The operation of the gas flame will cycle automatically from Low Flame to High Flame or Off as required to maintain the set point temperature.

*See **Digital Temperature Controller** description below for more details.*

Burner On Indicator Light

This light is lit when the **ON** position is selected on the main control switch and a flame is preset inside the oven.

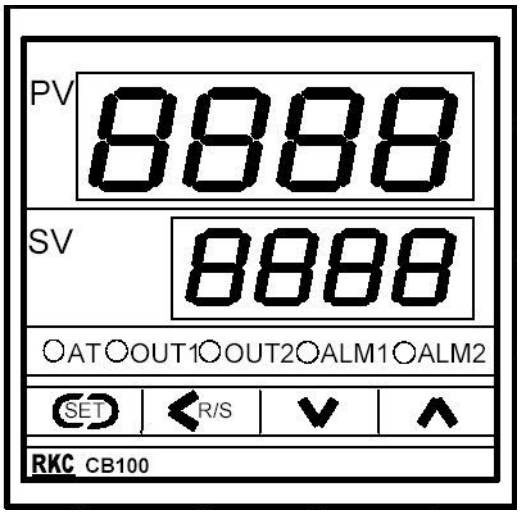
*The main control switch should always be set to **OFF** when any service work or inspections occur. Disconnect power from the wall socket. All service work should be carried out by a qualified and authorized technician.*

Fault/ Reset button

In the event of the burner failing to light, the Fault/ Reset button will light and the burner will go into 'lock-out mode'. In this mode, the oven is 100% safe; no gas can flow.

To restart the burner from 'lock-out mode' *(white light on)* press the white light 'reset' button. If the burner fails to light after three attempts, turn the control switch to **OFF** and refer to the troubleshooting section of this manual or call in a service professional.

Digital Temperature Controller



The Digital Temperature controller has two (2) main functions. To display the current oven temperature (PV- Present Value) and an adjustable setting to enable the operator to determine the desired oven operating temperature (SV - Set point value).

To change the set point (SV) temperature up or down;

- Press **SET**
- Press ◄**R/S** to move the degree of change. *(i.e. to change tens or hundreds)*
- Press the ▲ (up) or ▼ (down) arrows until desired temperature is selected
- Press **SET** to enter the information

See the following section for the different temperature control procedures.

Temperature Control Procedures

Typical cooking temperature for pizza is 250-350°C and for breads 200-250°C. The burner controls on this oven have been designed to enable the operator to fire the oven using Gas, Wood or a combination of both.

Using Gas only

In this situation the burner will start on High Flame *(intensive flame)* and heat the oven to the preset (SV) temperature on the Digital Temperature controller. Once the oven has reached this temperature, the burner will automatically turn to Low Flame *(less intensive, maintaining flame).*

This flame will maintain the oven temperature until the temperature starts to fall below the set point (SV) at which time the High Flame will cut in and heat the oven back to set point (SV).

Should the temperature continue to rise on Low Flame, the gas burner will cease to burn at approximately 20°C above the set point temperature. It will automatically start again once the temperature falls below the set point temperature. This cycle will continue as long as the oven is in the **ON** position.

Using Gas and Wood

NOTE: *Wood should not be placed on, or lean against, the tube burner shroud – any ash or debris that falls down the burner tube will cause the burner to fail.*

The above mentioned cycle is the same if using a combination of both fuels. However, once the oven has reached set point and turned to Low Flame, should the temperature continue to rise, *(due to the burning wood)* the gas burner will cease to burn at approximately 20°C above the set point temperature. The Gas system will then be in standby mode, waiting for the temperature to fall below the set point temperature. It will automatically start again once the temperature falls below the set point temperature.

It is strongly advised not to burn wood on top of the Thermocouple or erratic Gas operation will result.

Using Wood only

Using Wood only in an oven that has a gas back-up system is quite an acceptable and common practice. The Digital Temperature controller can tell you the present oven temperature (PV) when the operating switch is set in the **CONTROL** position.
This is very useful for gauging the fuel requirements of the oven.

Gas Ovens

The gas flame modulates from **OFF**, **LOW FLAME** and **HIGH FLAME** keeping the oven at the desired set point (SV) temperature. *(250-350°C)*

Once the oven reaches cooking temperature the pizzas can be placed in the oven with or without trays within 150mm of the fire and in layers out.

Combined Wood and Gas

When firing using combined Wood and Gas, if the gas back-up burner does not appear to be firing much, it may just mean that there is sufficient heat from the wood fire to satisfy the thermocouple, not requiring the gas burner operation.

Wood Fired Ovens

As described in Preheating with Wood, start a small fire in the mouth of the oven with kindling and proceed making the fire with progressively larger pieces of wood. When the large logs *(100mm-125mm diameter)* are burning, push the fire to the back or side of the oven chamber.

To reduce the amount of smoke produced when lighting, dry the wood in the oven cavity overnight. Be sure to keep the wood clear of embers.

As the wood embers reduce, more wood should be placed on the fire. When there appears to be too much ash, simply drag this out and place in your steel ash receptacle.

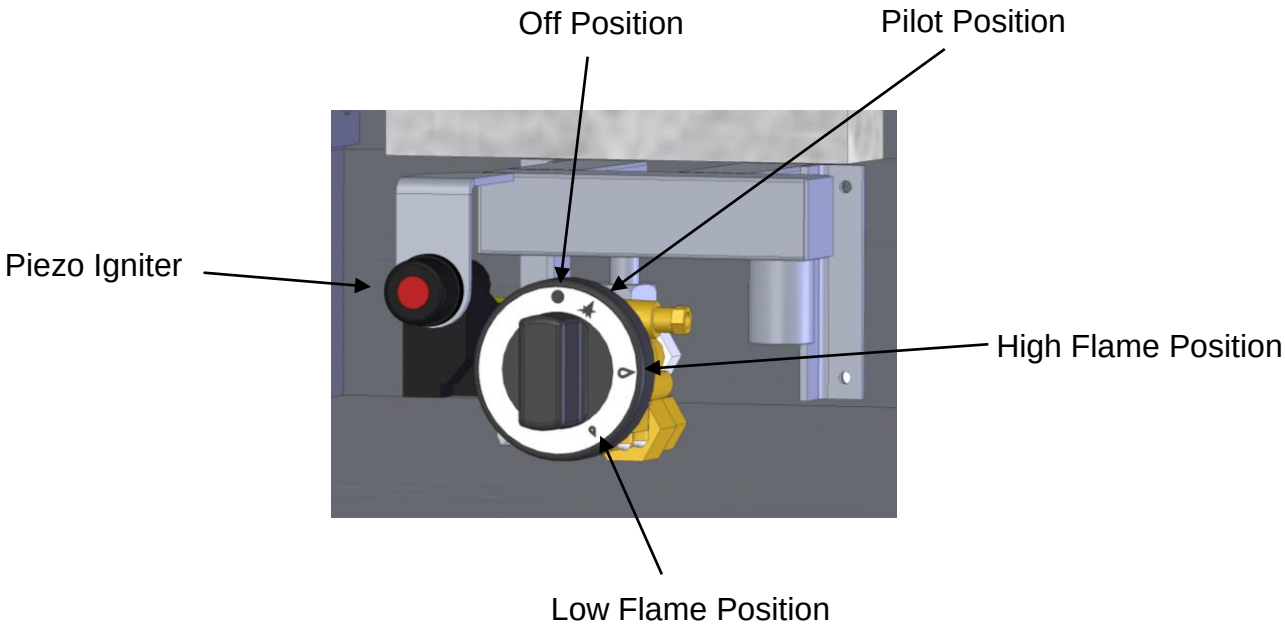
There is, however, a surprisingly small amount of ash compared to the amount of wood consumed. Most restaurants only clean out once a day in the morning at start-up. The quantity of ash reduces when using better quality hard wood fuel.

NOTE: *Removing ash should always be done with great care as hot embers may be hidden in the ash.*

Char Grill

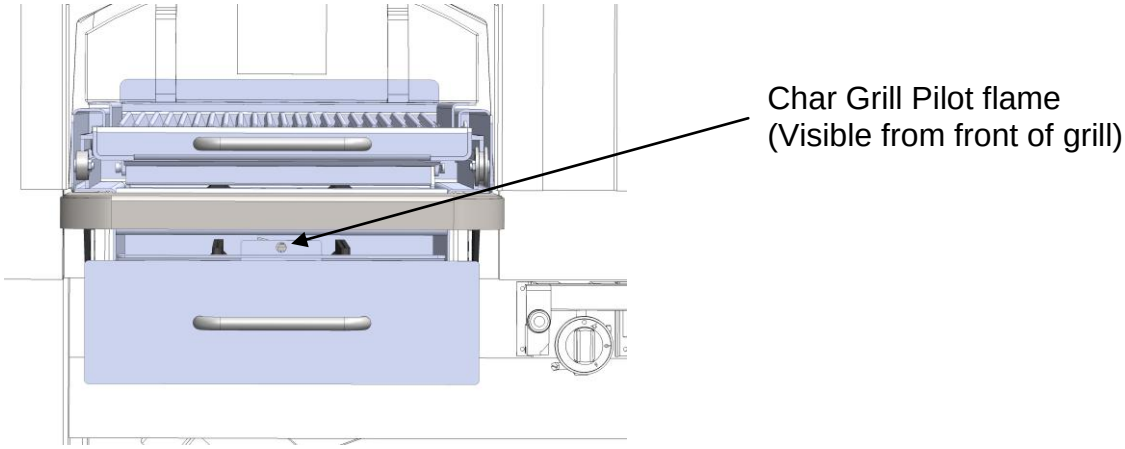
The following instruction relates to those ovens fitted with the Char Grill option. The Char Grill is a fully independent gas system connected directly to the main Gas supply and is not directly controlled by the Gas Control cabinet.

The Char Grill is manually operated using the Main valve located between the oven doors.



Lighting the burners (Char Grill)

Press slightly and turn the Main valve counter-clockwise to ✸ *(Pilot)* position and press fully in. While pressing the Main valve in, push and hold Piezo igniter button to light the pilot unit located below the hearth.



Continue to press the main valve for twenty (20) seconds. *(This is to allow the thermocouple enough time to sense a flame and open the main burner's gas supply.)*

Release the main valve. *(The pilot flame should now stay alight.)*

To choose between High and Low Flame, slightly depress the main valve and turn to the required flame.

For the three (3) and four (4) burner Char Grills, repeat for both pilots.

To turn off, depress the main valve slightly and turn to ● *(**OFF**)* position.

*(The Char Grill can be safely left in the Pilot position when not in use, though it is recommended to turn to the ● (**OFF**) position when finishing for the day.)*

Replacing the Char Grill Piezo Battery

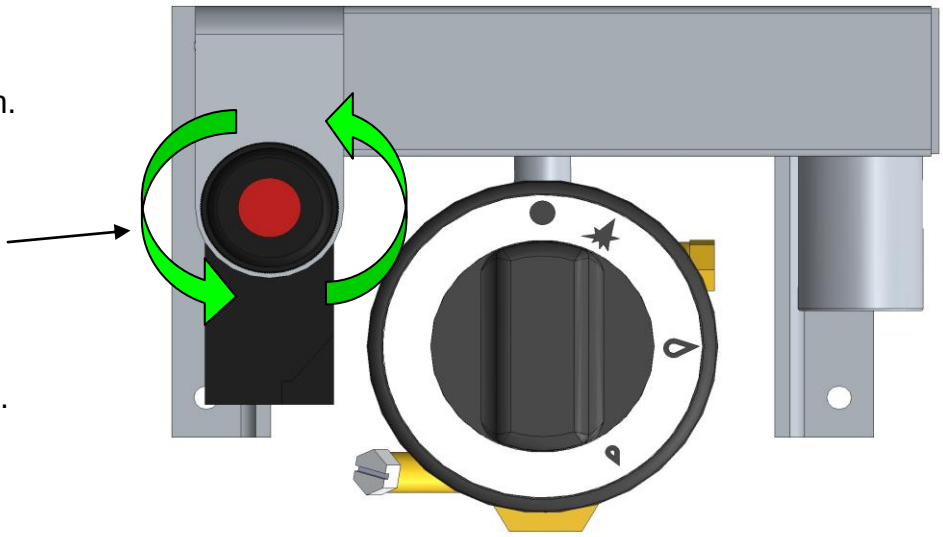
If the Piezo does not spark, it is possible that the battery has expired. To replace the battery follow the instructions below.

1. Unscrew the Piezo button.

2. Replace the battery.

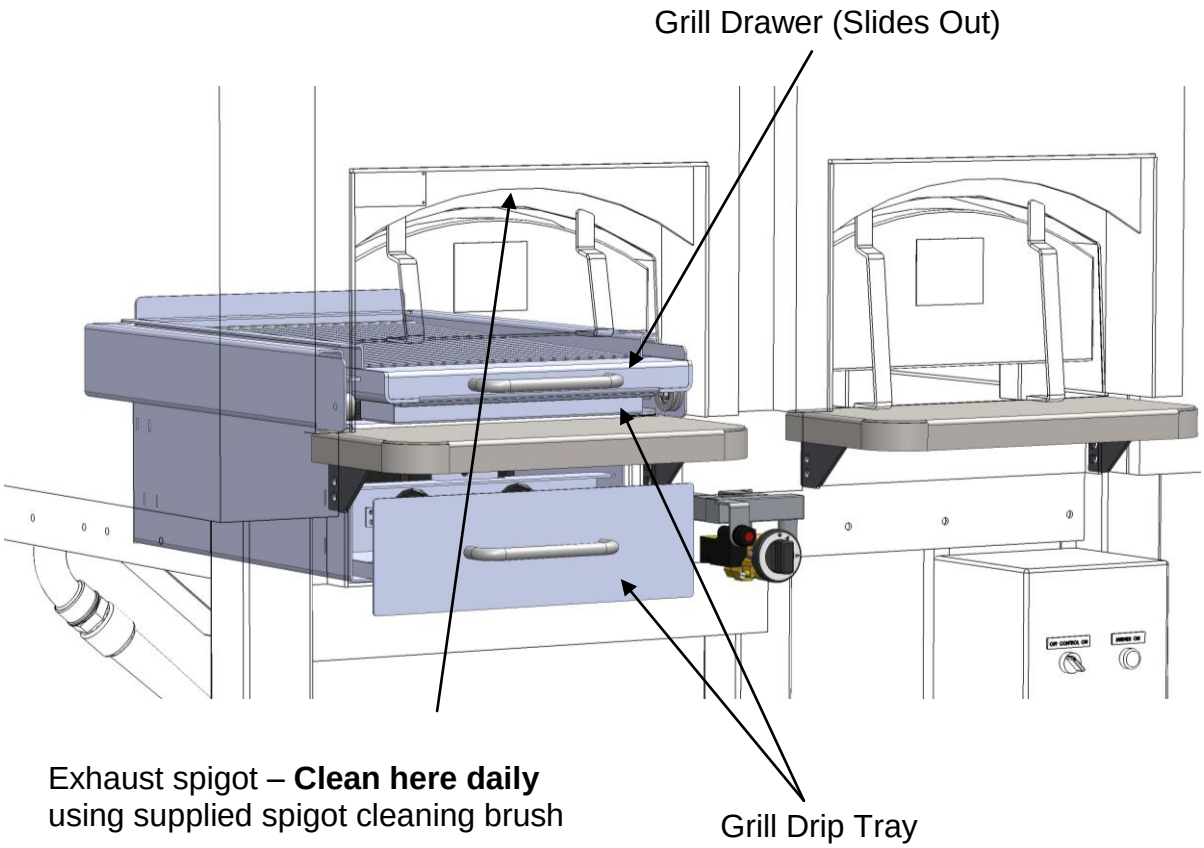
(Be sure to insert the new battery with the poles in the correct direction)

3. Replace the Piezo button. *(Do not over tighten)*



If the Piezo still does not spark – having checked that the battery is OK and fitted correctly – check that the cable from the Piezo to the pilot is connected and in good repair. For further assistance contact Beech Ovens service department technical@beechovens.com

All Beech Ovens supplied with a char grill option are supplied with a spigot cleaning brush. This long handled brush should be used daily to clean any excess soot or grease from the exhaust spigot above the mouth of the grill. This area can get contaminated with flammable material from the grilling process. **Fire risk occurs with poor maintenance.** *(Refer to **Flue Fires** section in this manual.)*



Finishing for the Day

When you have finished for the day, simply turn the main Gas control switch to **OFF** and if you wish, spread the coals. This is not always necessary. Any size fire can be left burning safely. Some owners put another log on to keep the oven hot overnight. It is safe to leave the fire burning and the gas switched **ON** or **OFF**.

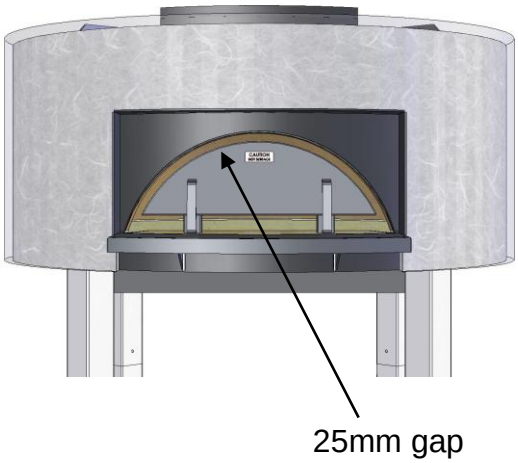
A stainless steel Plug Door is supplied and recommended for the oven to keep the heat in overnight.

*See the following section **Plug Door Placement***

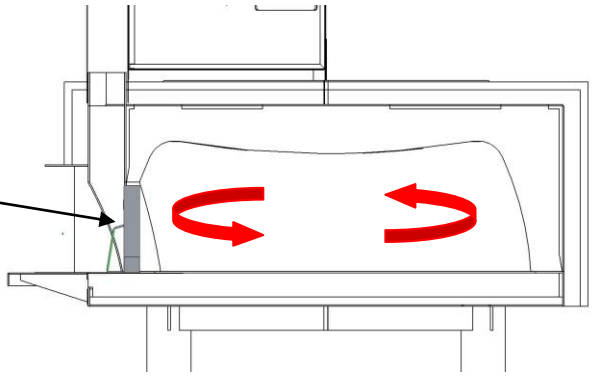
Plug Door placement

The stainless steel Plug Door is a loose fitting door used to retain the majority of heat within the oven when the oven is not in use. It is **NOT** designed to entirely block the opening, as this could potentially overheat the oven, or allow build up of dangerous gases inside the oven cavity.

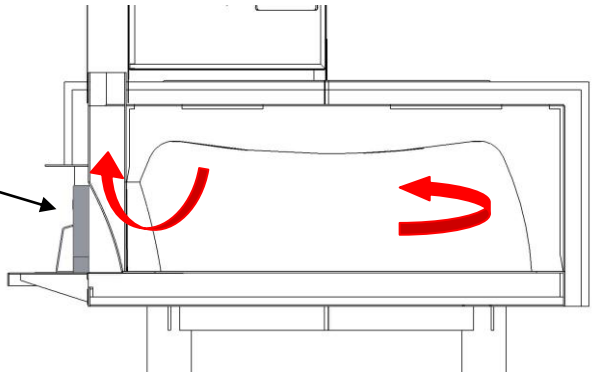
It is advisable to use the Plug Door in the main oven opening(s) whenever the oven is not being used to conserve energy. This is important especially overnight when no fire is present.



Correct positioning.
This helps to reduce heat and energy loss.



Incorrect positioning.
Heat and energy is lost from the oven into the flue.



Remember to replace the special low profile Char Grill plug door in the Char Grill whenever it is not being used to reduce heat and energy loss from this opening.

Section 4 – Maintenance & Technical Specifications

Maintenance & Technical Specifications

Oven Maintenance

If properly cared for, your Beech Oven will give you many years of trouble free operation. We recommend you consider adopting the following **Preventative Maintenance Service Schedule**, which will ensure your oven operates at optimum efficiency, saving you money on operating and repair costs, ensuring your business is trading to its full potential.

It is critical to maintain the Beech Oven and associated equipment on a regular basis, to avoid the possibility of a serious fire or malfunction.

Regular **Preventative Maintenance Service** will also save you money on loss of profits from any down time.

Beech Ovens strongly recommends a three (3) monthly inspection of the Flue system as to ascertain the levels of soot, grease and creosote build up during this period. Through these regular inspections you can develop a program for regular cleaning of your exhaust system. *(Refer to **General Information on Flues**)*

A minimum of 25mm Air Circulation Gap is recommended between the outer oven insulation and any other material. It is of utmost importance that these spaces remain free to circulate air. Checks should be made on a regular basis as to confirm these spaces are maintained. These items are critical to the safe and reliable operation of the oven.

Where additional options are fitted, such as the Interlock system (Australia Only) and the Water Flow Sensor (UK Only), maintenance to these items will need to be included into the following maintenance schedule.

The following maintenance Schedule is a summation of information contained within this Installation and Operation Manual.

Item	Task to be performed	Performed by	Frequency				
			Daily	Weekly	Monthly	3 Months	6 Months
1	Each morning before the oven is fired up, remove fire ashes from the floor centre, using an ash pan and a shovel or brush. A damp cloth may be used to remove any remaining dust.	Oven Operator	♦♦				
2	Clean the oven floor prior to cooking. Do **NOT** use water!	Oven Operator	♦♦				
3	Cleanliness around the oven is essential. Ensure no debris or rubbish is left around, under or in the oven area.	Oven Operator	♦♦				
4	Ensure that a draft at spigot exhaust above the oven mouth is detected when the exhaust fan is operating.	Oven Operator	♦♦				
5	**For ovens equipped with a char grill, regular cleaning of the oven spigot is required, depending on usage**. After a suitable cooling down time, stainless steel grill plates, drip tray and cast iron radiants should be removed for cleaning and the remainder of the char grill should be wiped out. Take care not to damage the gas pilot assembly. Ribbon burners should be removed for cleaning and blown out with compressed air.	Oven Operator Oven Operator Technician	♦♦	♦♦	 ♦♦	 ♦♦	
6	For ovens equipped with a spray filter, the tundish drain should be checked that water is flowing at a trickle rate.	Oven Operator	♦♦				
7	Visually inspect the oven interior roof for blackness. Should blackness become evident, the oven may need some attention. If the blackness is from cooking foodstuffs, the oven may need a period of high firing in excess of 450°C, to burn clean the oven cavity. If the blackness appears to be from the gas flame, a qualified technician should be called to service and adjust the system.	Oven Operator		♦♦			

Item	Task to be performed	Performed by	Frequency				
			Daily	Weekly	Monthly	3 Months	6 Months
8	Visually check and clean any foodstuff, dirt or deposits from burner with a suitable small brush. Take care not to damage the tri-electrode over burner.	Oven Operator		♦♦			
9	Carry out a comprehensive check of the oven, gas system and exhaust, including spray filter (or flue transition) and ductwork. Check that approved and inspected fire extinguishing equipment is in close proximity to the oven.	Oven Operator Technician				♦♦ ♦♦	
10	Check correct exhaust airflow calibration and temperature at the exhaust spigot over the oven mouth, using the A4 paper test method. Adjustment of damper should not be necessary, unless restaurant / kitchen conditions have changed. Having the correct draw at oven mouth is critical to performance.	Technician				♦♦	
11	Inspect and clean out oven extraction flue and ductwork, to remove any accumulation of creosote, soot and grease which may have occurred. If accumulation is present, it should be removed to reduce the risk of fire. Ensuring extraction ductwork is kept clean, will reduce the risk of fire.	Technician				♦♦	
12	Check and verify correct operation of gas interlock system. When exhaust fan is switched off, the thermocouple probe in exhaust duct should register a rise in temperature and shut off the gas supply to oven burners.	Technician				♦♦	
13	Inspect high temperature cables from control box to burner head and tri-electrode device. Ensure insulation is in good order especially where cables may cross over metal framework. Check cables at burner and end for any sign of burning.	Technician				♦♦	

Item	Task to be performed	Performed by	Frequency				
			Daily	Weekly	Monthly	3 Months	6 Months
14	Check correct burner flame / air mixture adjustment. Check for correct operation, ensure flame is not luminous and the burner is free from debris.	Technician				♦♦	
15	Visually inspect condition of tri-electrode and carefully clean any ash or food which may be present. Check tri-electrodes have correct clearance from burner.	Beech Technician				♦♦	
16	Check for correct operation of balanced cool air make-up device, fitted to flue transition, when the fan is switched on and off.	Beech Technician				♦♦	
17	Check that temperature indicated at oven thermostat control is calibrated to provide accurate oven temperature.	Beech Technician				♦♦	
18	For ovens equipped with spray filter, check water is flowing to tundish at a trickle rate (15-35lts/hr). Check for water leakage at spray filter and clean tundish drain. Ensure water return flow and that tundish is clear.	Beech Technician				♦♦	
19	For ovens equipped with spray filter, remove and clean the spray filter nozzle and supply tube. Check for correct spray pattern. The inline water filter should be cleaned / replaced at this time. Remove and clean the cyclonic filter at this time.	Beech Technician				♦♦	
20	Check the area under oven is free of obstruction for correct ventilation to burners. Ensure no debris or rubbish is left around, under or in the oven area.	Beech Technician				♦♦	
21	Check / adjust gas pressure at the outlet side of gas regulator. Natural Gas is set to 1.0 kpa. LPG is set to 2.75 kpa	Beech Technician					♦♦
22	Check exhaust fan for correct operation.	Beech Technician					♦♦

Tri-Electrode and Burner Maintenance

The most common cause of erratic operation of the Gas system is that the Tri-electrode and/or burner becomes contaminated by debris. This may be in the form of foodstuffs or ash deposited in the area in which the Tri-electrode and/or burner operates.

The following instruction shows the procedure for checking the position of the Tri-electrode and removal of any debris which may become present around the Tri-electrode and/or burner. Adjustment should generally not be necessary, though cleaning is common as part of regular maintenance.

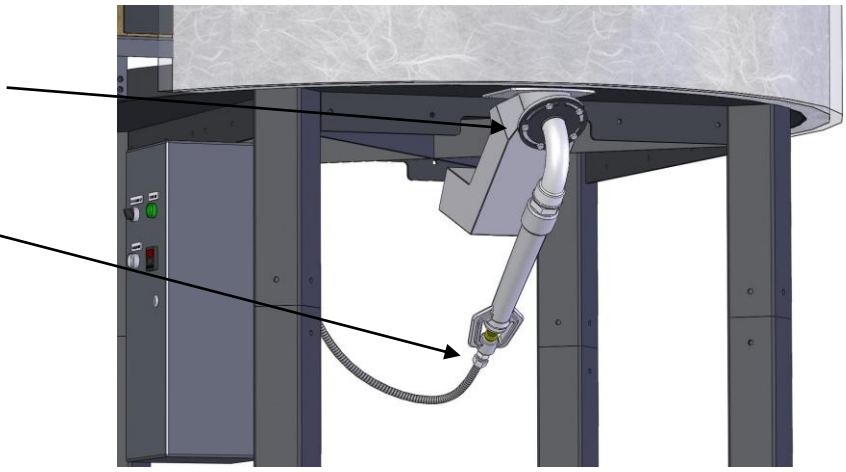
Note: *Be sure to **turn off the power and Gas** before any maintenance takes place on the oven. Maintenance should be carried out when the oven is cold.*

Tube Burner

To remove the Tube burner, loosen and remove the burner flange bolts *(3-5 bolts).*

Should the burner require cleaning, remove the gas line into the burner. This is a flared connection and does not require sealant.

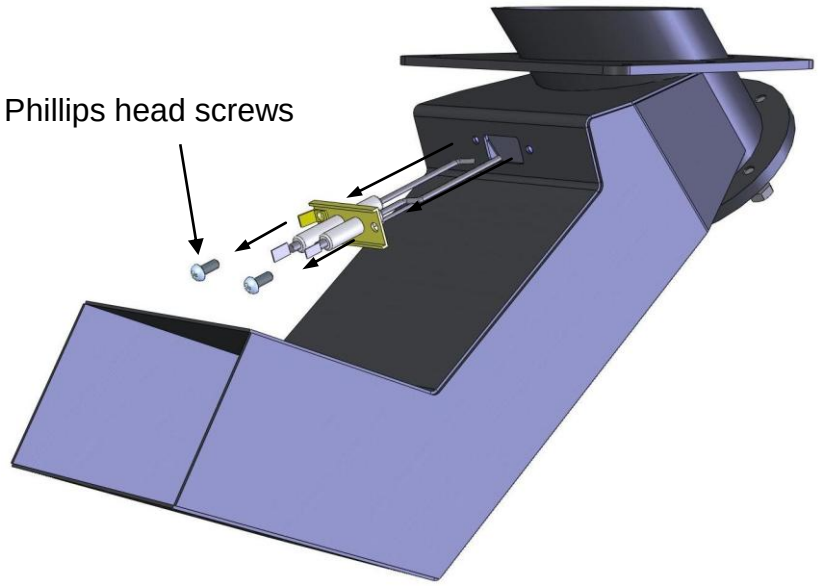
Note: Be sure not to kink or damage the Gas line whilst handling the burner.



Clean, if required, by turning upside down and blowing out any debris that may have built up in the burner nozzle.

In extreme cases, the burner can be washed and scrubbed with a brush. Use compressed air for final clean.

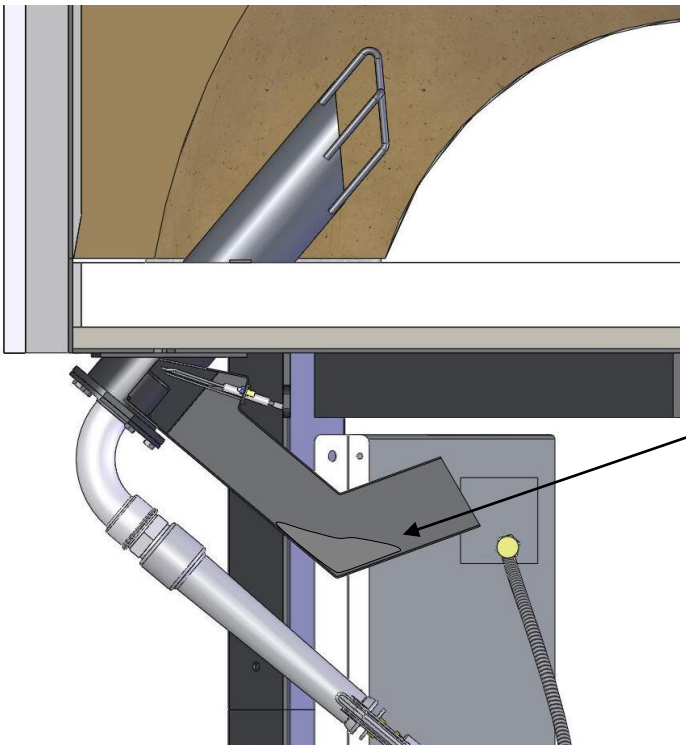
To remove the Tri-electrode assembly, loosen and remove the two (2) Phillips head screws holding the Tri-electrode.



Note: *The Tri-electrode is mounted in a ceramic base and is easily cracked if not handled correctly. Always check for cracks when servicing this component.*

Carefully remove the Tri-electrode and **gently** remove any debris which may have built up around the Tri-electrode using a soft brush or rag.

Note: Be sure not to adjust the positioning of the Tri-electrode probes. Positioning of these probes is critical for the correct function of the gas system. See next page for correct positioning details.

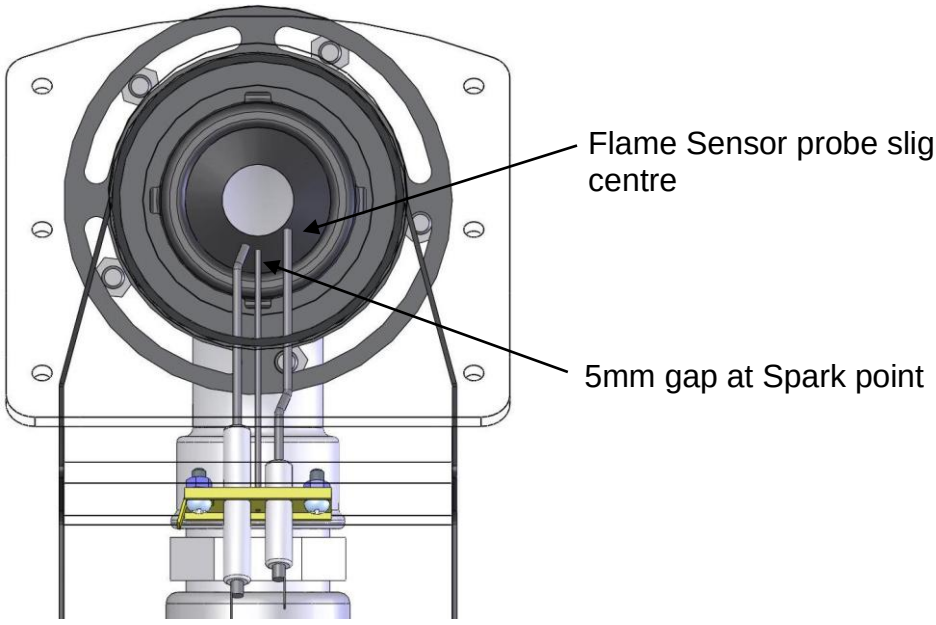


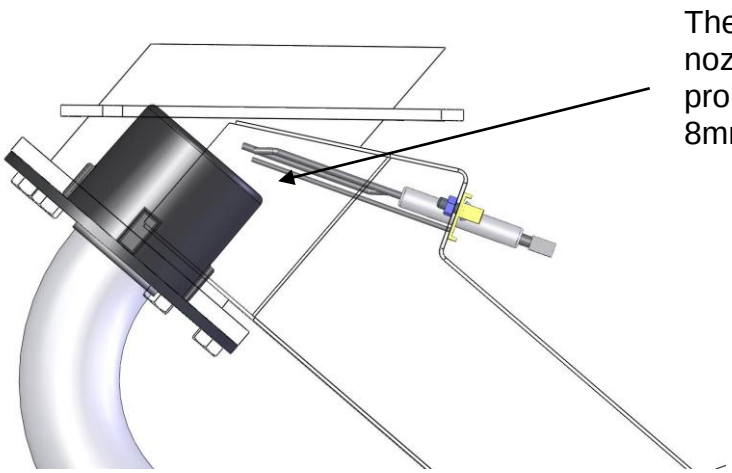
As general maintenance, clear any debris that may have accumulated in the base of blow back chute.

If the position of the probes has been altered, be sure that the Flame Ignition probe and Earth probe have an approximately 5mm gap between them at the Spark point.

These two (2) probes should **NOT** be close to any other metallic surface or close to each other, other than at the Spark point as shown below.

The Flame Sensor probe should be slightly off centre.

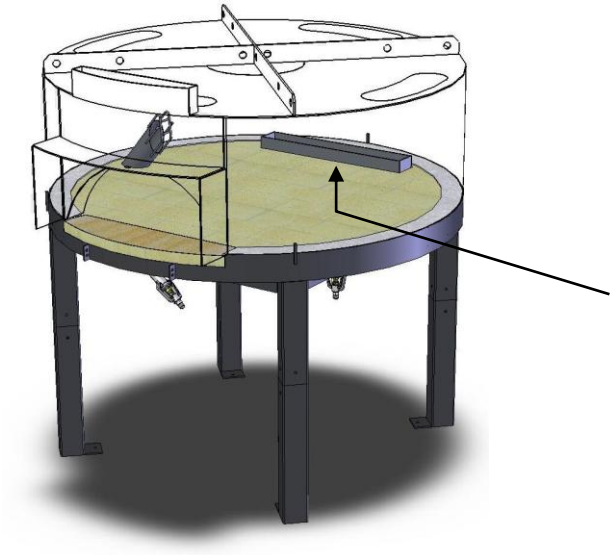




Note: *Be sure to check that all Gas lines, cabling and bolts are correctly assembled and secured before turning on power and gas for re-start.*

Display Burner

When using a Display burner, wood fuel should **NOT** be used. However, foodstuffs and other debris can disrupt the correct operating function of the Tri-electrode on a Display burner.



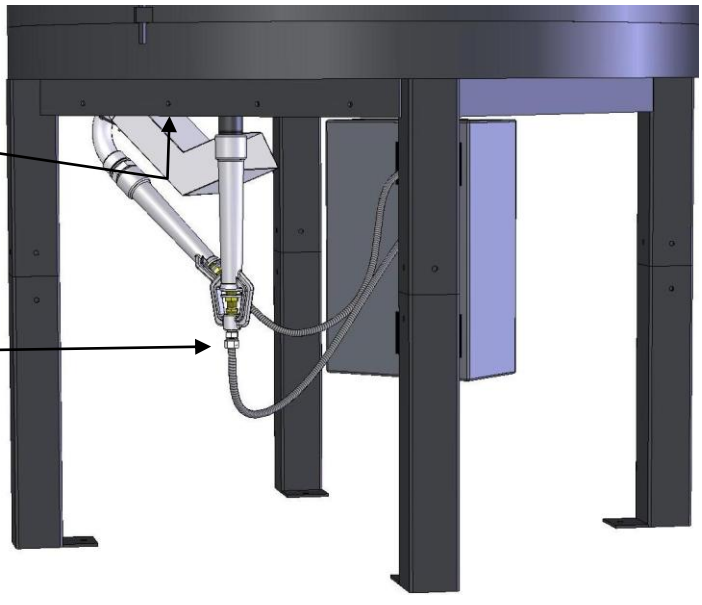
If the oven is cold and access is possible, in some cases the Display burner can be accessed through the door of the oven. The Tri-electrode is directly behind the burner shroud.

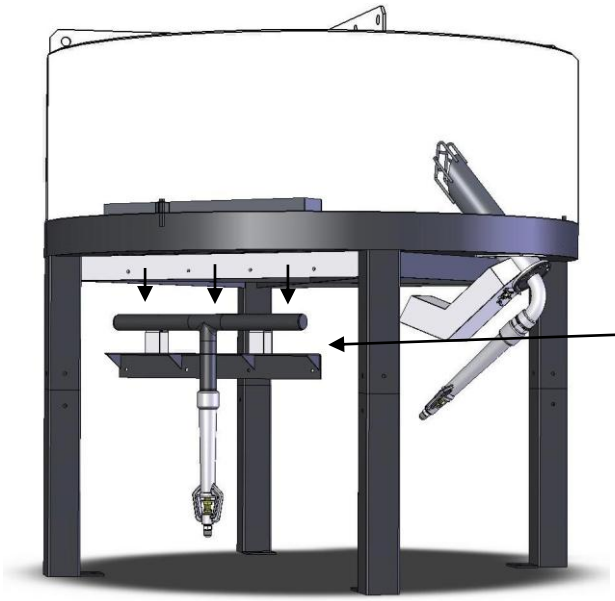
If access is not possible through the door, the entire Display burner assembly can be removed through the base of the oven.

To remove the Display burner, loosen and remove the four (4) bolts in the rear support of the oven base.

Should the burner require cleaning, remove the gas line into the burner. This is a flared connection and does not require sealant.

Check the condition of the blue high tension/temperature leads and insulting sleeve to the Tri-electrode. Replace if necessary.



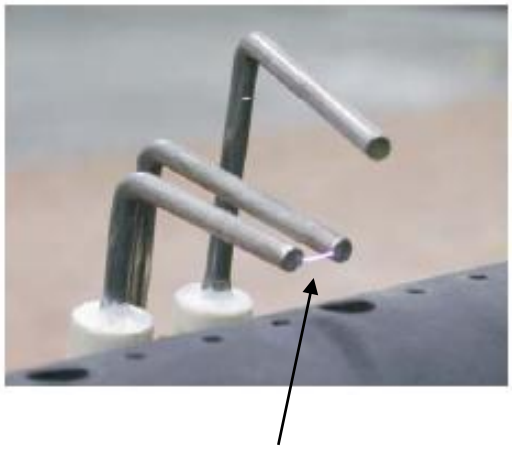


Carefully lower the Display burner from the oven base. Be sure not to bump the position of the Tri-electrode when removing and replacing the burner.

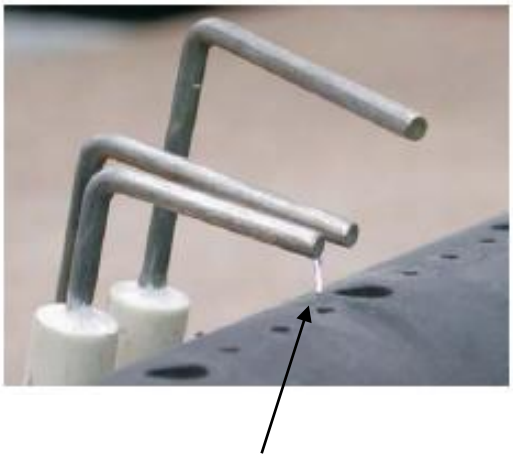
With the Display burner removed the Tri-electrode and/or burner can be cleaned and/or adjusted.

Connect the leads securely to the Tri-electrode correctly and be sure that it is correctly adjusted before re-assembly.

Incorrect positioning of the Tri-electrode is also a common cause of erratic Gas System operation with the Display burner.



Correct positioning: A spark is generated at the Spark point.



Incorrect positioning: A spark is generated between the Flame Ignition probe and the burner body.

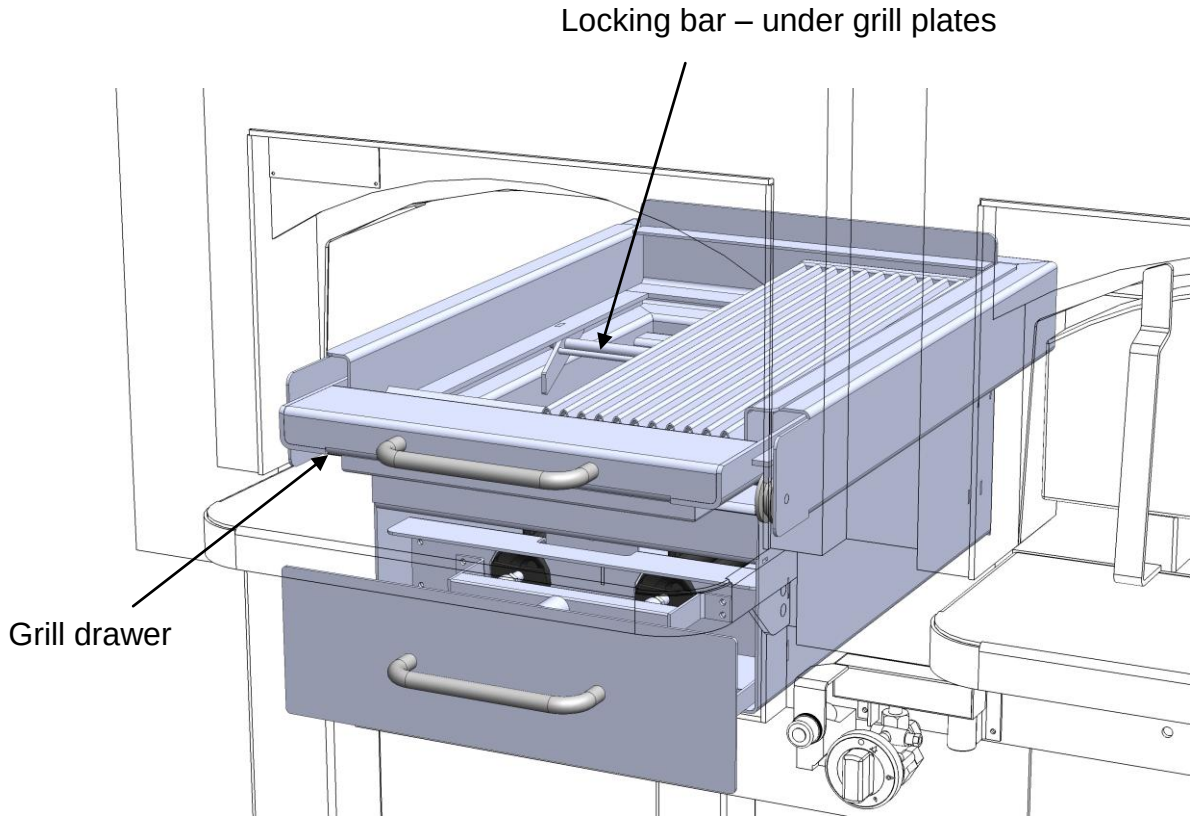
Note: *Be sure to check that all Gas lines, cabling and bolts are correctly assembled and secured before turning on power and gas for re-start.*

Char Grill Maintenance

As part of the daily maintenance schedule, the Char Grill should be cleaned thoroughly after each service. The drip trays may need to be emptied during service depending on the type of product being cooked. The upper drip tray is located under the front of the grill drawer and is easily removed out of the right hand side of the grill drawer. The lower drip tray pulls forward and out.

To remove the grill plates, roll the grill drawer forward and lift the grill plates out of the grill drawer, one (1) at a time.

With the grill plates removed, the entire upper grill drawer can be removed for maintenance if required.



Lift the locking bar in the centre of the drawer and carefully pull forward. Try to keep the drawer level when removing as to not damage any of the roller components.

NOTE: *Do **NOT** place the entire drawer in a dishwasher or wash with acidic cleaning agents. The drawer rollers contain bearings which can be damaged.*

Window Maintenance

Some ovens have a viewing window accessory which enables the internal of the oven to be viewed by the public to enhance the visual experience of stone hearth cooking. In some cases the window may need to be cleaned as soot and smoke can contaminate the inner glass.

Note: *Only open the oven viewing window when the oven is OFF and cool.*

There are a number of different cleaning agents available on the market, though the method below explains a simple, cheap and effective method to cleaning the inner glass.

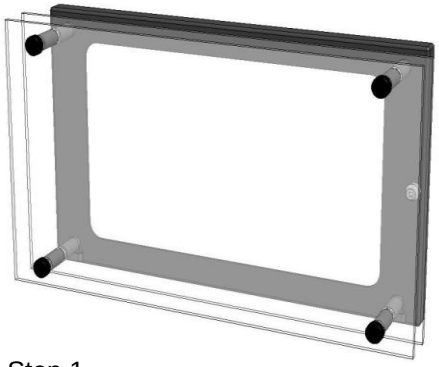
Cleaning the Internal Glass

Using a sheet of regular newspaper, scrunch the sheet and lightly dampen the paper in water. Apply the damp newspaper to some of the cool ash from the wood fire and lightly wipe the glass to loosen the soot from the glass. When the soot is dissolved, use a fresh sheet of damp newspaper to clean the remainder of the soot from the glass.

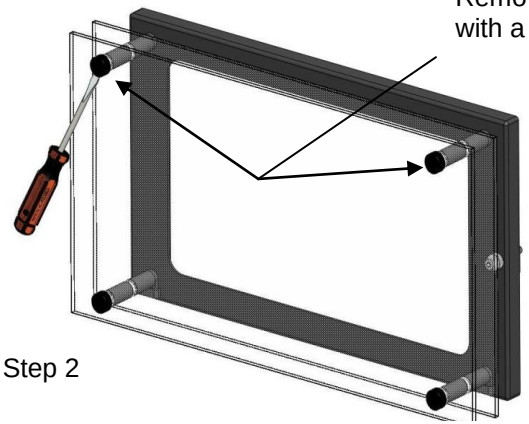
This method also helps to prevent the build up of soot on the glass.

NOTE: Do not use any acidic or harsh cleaning agents to clean the glass, as they could damage the protective coating on the glass.

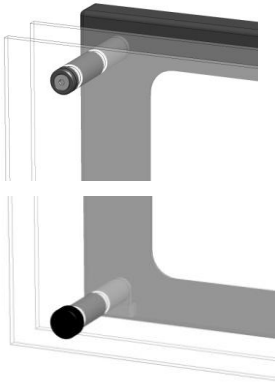
The following page shows the sequence to remove the outer panes of glass to gain access to the handle to open the viewing window.



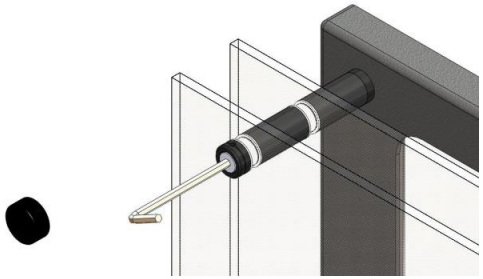
Step 1



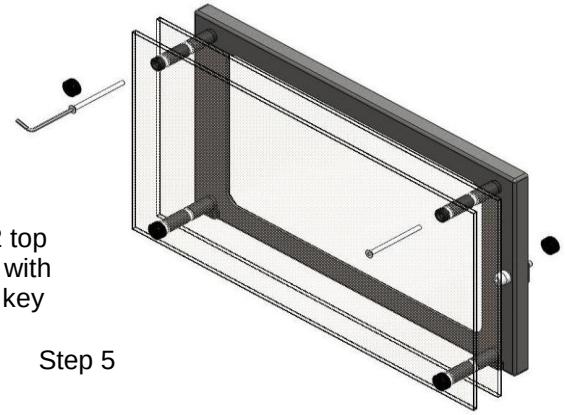
Step 2



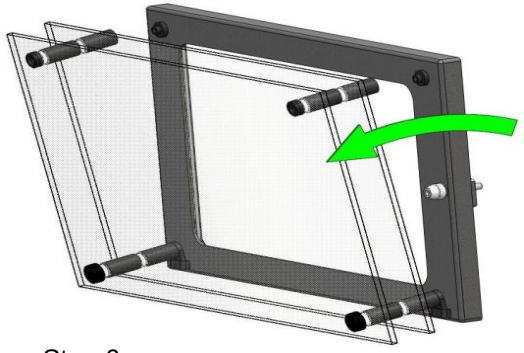
Step 3



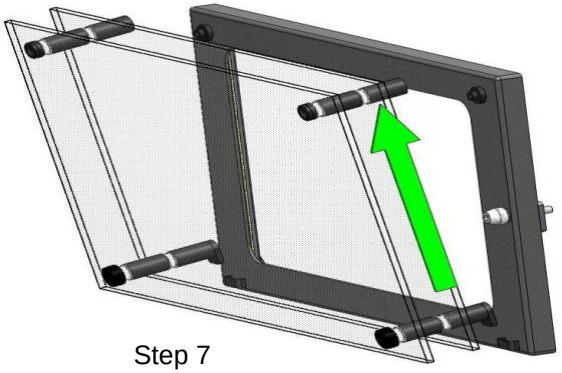
Step 4



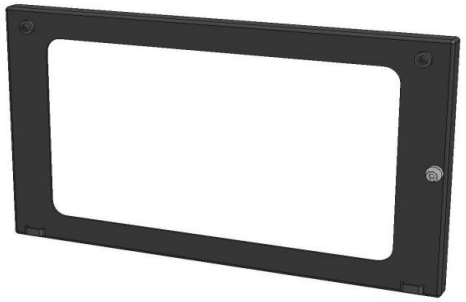
Step 5



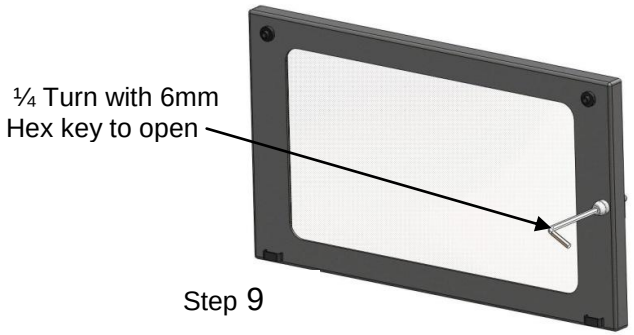
Step 6



Step 7



Step 8



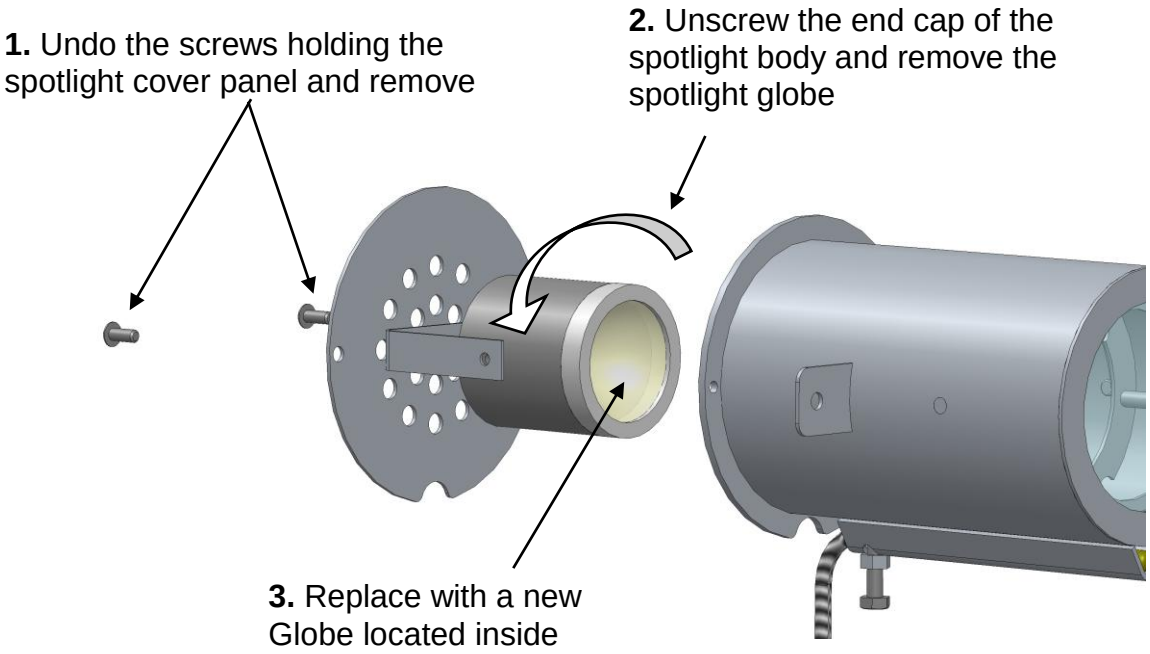
Step 9

Spotlight Maintenance

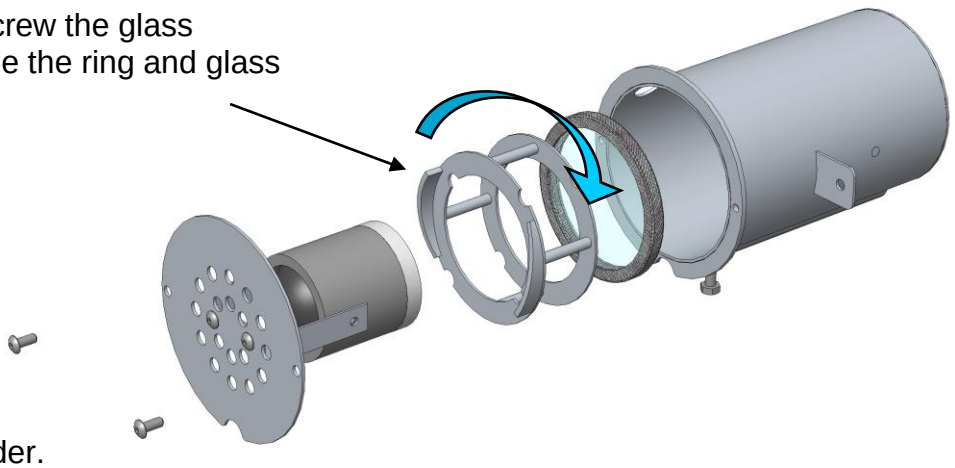
Normal maintenance with the oven spotlight should only ever consist of globe replacement and/or glass cleaning or replacement.

For any electrical connection, alterations or maintenance always use a licensed electrician.

To access the globe, remove the access panel to the spotlight and remove the cover panel to the spotlight. The spotlight body is attached to the cover panel.


1. Undo the screws holding the spotlight cover panel and remove
2. Unscrew the end cap of the spotlight body and remove the spotlight globe
3. Replace with a new Globe located inside

To remove the glass, remove the cover panel as above. Unscrew the glass retaining ring and slide the ring and glass out of the tube

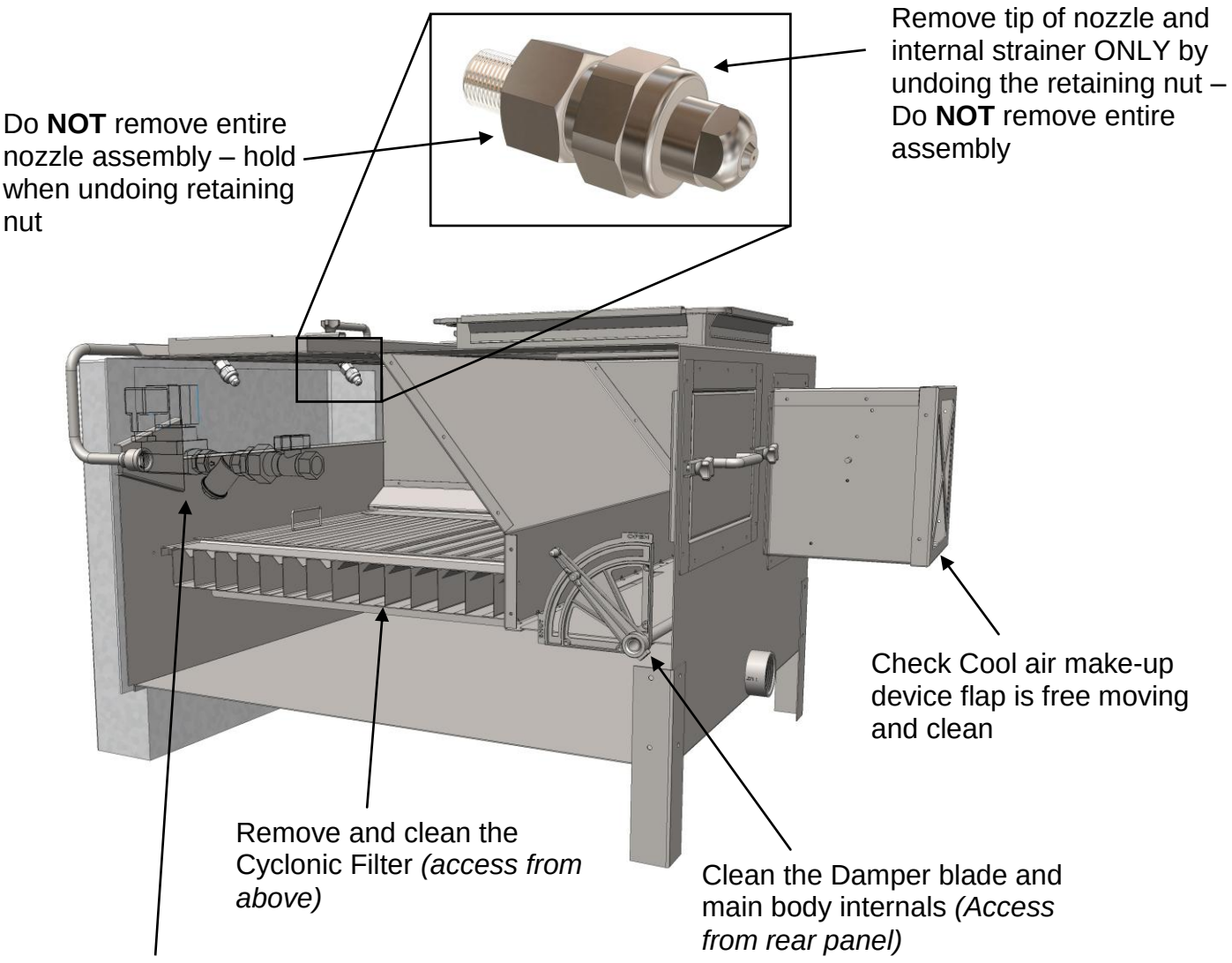


Assemble in reverse order.

Spray Filter Maintenance

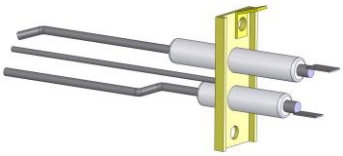
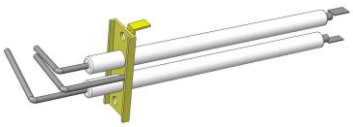
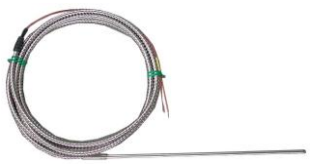
Maintenance of the Spray Filter should occur regularly and in accordance with the maintenance schedule as listed above. General maintenance consists of the following:

- Remove and clean the cyclonic filter
- Clean / replace the spraying nozzles and filters
- Check the cool air inlet mechanics are free moving
- Check / replace the in-line “Y” filter/strainer
- Clean the damper blade and clean internals of the main body
- Check that the solenoid is functioning correctly
- Check overall condition – check for signs of water or soot leakage


Remove tip of nozzle and internal strainer ONLY by undoing the retaining nut – Do **NOT** remove entire assembly
Do **NOT** remove entire nozzle assembly – hold when undoing retaining nut
Check Cool air make-up device flap is free moving and clean
Remove and clean the Cyclonic Filter *(access from above)*
Clean the Damper blade and main body internals *(Access from rear panel)*
Remove and clean “Y” strainer and check solenoid is functioning correctly

Spare Parts List

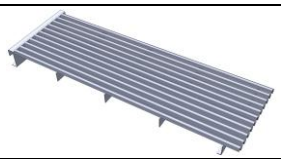
The following is a condensed list of spare parts for most ovens. Although it is not necessary to carry any or all spare parts, we do recommend that some of the parts mentioned below be kept as they are crucial to the ovens operation.

Gas System Parts			
Image	**Item Description**	**Brand / Type**	**Part No.**
	Digital Temperature Controller *(Single)*	RKC. RexCB100	SPAREPT-1008
	Digital Temperature Controller *(Double)*	RKC. RexCB100	SPAREPT-1009
	Tri-Electrode *(Tube Burner)*	Tri-Electrode	PARTGAS-1624
	Tri-Electrode *(Display Burner)*	Tri-Electrode	PARTGAS-1623
	Flame *(Ignition)* Pack	Brahma 12U	SPAREPT-1010
	Gas Combination Valve	Sit Nova 826	SPAREPT-1011
	Thermocouple	Type K Shielded	SPAREPT-1003

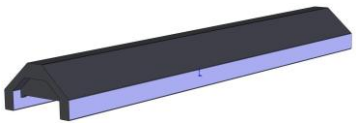
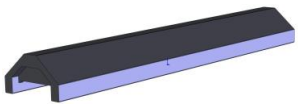
Spare Parts *(cont')*

Gas System Parts *(cont')*			
Image	**Item Description**	**Brand / Type**	**Part No.**
	Tube Burner *(Complete)*	Inspirator	PARTGAS-1617
	Manual Isolation Valve	Generic	PARTCOM-1600
	Tri-Electrode leads *(Blue)*	1.6m 2.2m	SPAREPT-1004 (1.6m) SPAREPT-1005 (2.2m)
	Relay	Omron LY-2	SPAREPT-1006

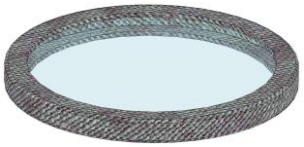
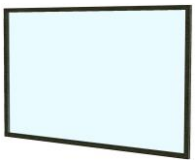
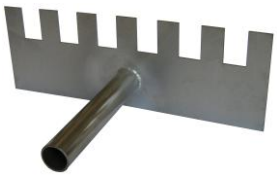
Spare Parts *(cont')*

Char Grill Parts			
Image	**Item Description**	**Brand / Type**	**Part No.**
	Char Grill Bed Long ***(Standard 600m for models prior to July 2010)***	Stainless Steel 150mm wide	AGRILLL-1100
	Char Grill Bed Short ***(500mm models prior to July 2010))***	Stainless Steel 150mm wide	AGRILLS-1100
	Char Grill Plate Standard **(Models after July 2010)**	Stainless Steel 200mmwide	SPAREPT-1050
	3 Way Winged Pilot *(Includes pilot jet) (Models after 2010 with spark electrodes with lead)*	Robert Shaw	SPAREPT-1015
	Char Grill Thermocouple *(900mm)*	Robert Shaw	SPAREPT-1014
	Char Grill Pilot spark electrode – with lead and protective sheath	Robert Shaw	SPAREPT-1049
	SS Pilot Tube *(1200mm)*	Generic	SPAREPT-1017
	SS Pilot Tube *(900mm)*	Generic	SPAREPT-1016

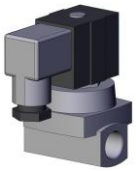
Spare Parts *(cont')*

Char Grill Parts *(cont')*			
Image	**Item Description**	**Brand / Type**	**Part No.**
	Char Grill Gas Control Valve Knob *(Control Knob ONLY)*	PEL	SPAREPT-1013
	Char Grill Gas Control Valve *(With Control Knob)*	PEL	SPAREPT-1012
	Ribbon Burner AC19	Carmichael	SPAREPT-1018
	Ribbon Burner AC14	Carmichael	SPAREPT-1019
	Cast Iron Radiant *(480mm)*	Carmichael	SPAREPT-1020
	Cast Iron Radiant *(350mm)*	Carmichael	SPAREPT-1020

Spare Parts *(cont')*

General Oven Parts			
Image	**Item Description**	**Brand / Type**	**Part No.**
	Spotlight Globe	Ultralife 12V 50W	ASPOTLT-1603
	Spotlight Glass *(with edge Gasket)*	Tempered Glass	ASPOTLT-1602
	Viewing Window Inner Glass *(with edge Gasket)*	Robax	AVWSTND-1607
	Peel Aluminium *(With 1300mm wooden Handle)*	Aluminium	AACTOOL-1602
	Rake	Stainless Steel	AACTOOL-1600
	Brass Brush	Brass Bristols	AACTOOL-1603
	Shovel	Stainless Steel	AACTOOL-1601
	Grill Spigot Brush	Nylon	AACTOOL-1604

Spare Parts *(cont')*

Spray Filter Parts			
Image	**Item Description**	**Brand / Type**	**Part No.**
	Spray Filter Solenoid Valve	SMC VXZ2240	ASFSTND-1611
	Spray Filter Spray Nozzle (32L/Hr) **(Models prior to July 2010)**	¼" B SS 1 BSPT	ASFSTND-1613
	Spray Filter Spray Nozzle (11.2l/Hr) (2 per Spray Filter) **(Models after July 2010)**	B1/8 TT-SS + T4W-SS	ASFSTND-1606
	Spray Filter 1/2" Y-Strainer *(In line Filter)*	CW617N PN20	ASFSTND-1612
	Spray Filter Manual Isolation Valve	15mm Ball Valve	PARTCOM-1600

General Technical Details

The data plate mounted on the inside of the Gas control cabinet contains the specific information for your oven. The following information is general technical details for all ovens and related Gas types, based on an 80Mj Gas Burner.

	Natural	**Propane**	**Town Gas**	**Char Grill**
Gas Pressure at Burner Injector	1kPa (High)	2.75kPa (High)	0.6kPa (High)	Natural Gas 1kPa LPG 2.75kPa
Gas Pressure at Isolating Valve	1.0kPa (Min) 5.0kPa (Max)	2.75kPa (Min) 5.0kPa (Max)	0.7kPa (Min) 5.0kPa (Max)	0.7kPa (Min) 5.0kPa (Max)
Gas Consumption per Hour (approx)	2.0 m^3/ Hr	0.6 m^3/ Hr	3.9 m^3/ Hr	1.0-3.0 m^3/ Hr
Timber consumed Hardwood, no Gas Lunch and Dinner	0.1 m^3/ day	0.1 m^3/ day	0.1 m^3/ day	N/A
Secondary air for Gas Burner (Equivalent to a 40cm x 40cm vent under the oven floor)	5.66 litres/sec			
Air Conditioning Heat Load	<2kW Heat Load			
Duct Size	300mm x 300mm Square (or equivalent round) for Fan Assisted 400mm x 400mm square (or equivalent round) for Natural Draft			
Air Flow Required	1 Door Ovens – 700 litres/sec (2520m^3/Hr) @ 130Pa Static Pressure 2 Door Ovens – 1000 litres/sec (3600m^3/Hr) @ 130Pa Static Pressure			

The following table shows the correct jet orifice size for the standard Beech Ovens gas burners.

Gas output (Mj)	**Natural Gas**	**LPG (Propane)**	**Town Gas**
50Mj	3.20mm	2.10mm	5.20mm
60Mj	3.60mm	2.30mm	5.40mm
70Mj	3.90mm	2.50mm	5.60mm
80Mj	4.10mm	2.60mm	N/A
Char Grill 19"	2.35mm	1.40mm	3.70mm

CE Specifications

The following table outlines the technical details for ovens installed within the CE region.

Natural Gas					
Country	**Category**	**Nominal Pressure**	**Heat Input**	**Nominal Rate**	**Injector Diameter**
DE	12ELL	20mBar	G20: 22kW G25: 19kW	2.3m ³/Hr	3.5mm (28 gauge)
AT, DK, ES, FI, IE, IT, PT, GB, SE, CH	12H	20mBar	G20: 22kW	2.3m ³/Hr	3.5mm (28 gauge)
BE, FR	12Er	20mBar	G20: 22kW	2.3m ³/Hr	3.5mm (28 gauge)
Propane					
DE, NL, CH, FR, ES	13P	50mBar	G31: 18.5kW	1.44kg /Hr	2.2mm (44 gauge)
PT, GB, CH, FR, ES	13P	37mBar	G31: 18.5kW	1.44kg /Hr	2.2mm (44 gauge)
Note: CH, FR and ES allow both 37 and 50mBar					

Timber Consumption: Hardwood	0.1m³/ day
Airflow required:	700 litres / sec. Suction controlled by system damper. (Direct connect)
Duct Size: Natural Draft	300mm square (900cm²) or equivalent area round.
Duct Size: Fan assisted	300mm square (900cm²) or equivalent area round.
Duct Material:	1.2mm galvanised or 0.9mm stainless steel *(As per local regulation)*
Secondary Air for gas burner:	6 litres / sec (approximately)
Air conditioning Heat Load:	<2 kW heat load
Electrical Data:	220-240 Volts 50 Hz ac 10 Amp supply with earth

Oven Materials

The following section describes the most common materials used in the construction of a Beech Oven. All oven materials are safe to handle when cool.

- The Oven Casing is mild steel with some stainless steel components attached.
- Oven Legs are galvanised steel.
- The Oven Hearth is typically stainless steel or granite. Please check for custom options.
- The Gas control cabinet is stainless steel.
- The Gas control cabinet components are all standard CE or AS approved units (various non-ferrous metals) and standard electrical components.
- The Upper oven cavity is high temperature castable with ceramic wool (KA) insulation between the steel shell and castable material.
- The oven casing is covered with 50mm of ceramic wool insulation.
- The oven base is high alumina clay brick with ceramic board insulation to the steel housing.
- Any glass that might be incorporated is ceramic glass. (*Fire-lite, Borafloat or Toughened Safety Glass)*
- The oven transition to the flue system is galvanised steel.
- The Spray Filter is stainless steel.

The remains of the wood fire should be handled with care. The ash left in the oven may be hot and it will be dusty. Handle with care.

Debris in the Flue is soot and grease *(Creosote, carbon and ash from the cooking oven).*

Disposal of any materials should be confirmed with a local authority as to type of disposal method suitable and permitted.

ECFIA General MSDS

ECFIA GENERIC MSDS

HIGH TEMPERATURE INSULATION WOOLS

31 01 00 *According to 91/155/CEE*

Table of contents

1 . . . IDENTIFICATION OF THE PRODUCT AND OF THE COMPANY

2 . . . COMPOSITION / INFORMATION ON INGREDIENTS

3 . . . HAZARD IDENTIFICATION

4 . . . FIRST AID MEASURES

5 . . . FIRE FIGHTING MEASURES

6 . . . ACCIDENTAL RELEASE MEASURES

7 . . . HANDLING AND STORAGE

8 . . . EXPOSURE CONTROL / PERSONAL PROTECTION

9 . . . PHYSICAL AND CHEMICAL PROPERTIES

10 . . . STABILITY AND REACTIVITY

11 . . . TOXICOLOGICAL INFORMATION

12 . . . ECOLOGICAL INFORMATION

13 . . . DISPOSAL CONSIDERATIONS

14 . . . TRANSPORT INFORMATION

15 . . . REGULATORY INFORMATION

16 . . . OTHER INFORMATION

1 . . . IDENTIFICATION OF THE PRODUCT AND OF THE COMPANY

. . . Identification of the product

XYZ (commercial name) contains :

CALCIUM-MAGNESIUM-SILICATE (CMS) WOOL

. . . Identification of the company

Identify (name, address, tel, fax):

- The local supplier (could be the sales office dealing with the particular customer)

- The HSE Department at the head office

- An emergency telephone number (optional)

2 . . . COMPOSITION/ INFORMATION ON INGREDIENTS

. . . Description

Ex : XYZ is a needled blanket.

. . . Composition

CALCIUM-MAGNESIUM-SILICATE (CMS) WOOL

(SiO_2 = 60% - 70%; alkali earth oxides [CaO, MgO] = 25% - 40%; ZrO_2 < 10%)

. . . OTHER INGREDIENTS

Eventually report hazard information for other substances in the product if: - the substance is on the list of dangerous substances - the substance is subject to an occupational exposure limit - you wish to draw the attention on a particular substance

This product is made of minerals, none of which is radioactive under the terms of European Directive Euratom 96/29.

In use this product can become contaminated with other materials and working practices should take into account the presence of such contaminants.

3 . . . HAZARD IDENTIFICATION

May cause mild mechanical irritation to skin, eyes and upper respiratory tract.

4 . . . FIRST AID MEASURES

Skin : In case skin irritation rinse affected areas with water and wash gently.

Eyes : In case of serious eye contact flush abundantly with water; have eye bath available.

5 . . . FIRE FIGHTING MEASURES

Non combustible products.

Use extinguishing media appropriate to the surrounding fire.

6 . . . ACCIDENTAL RELEASE MEASURES

Avoid creating dust. Provide workers with respirators if necessary (see section 8). Follow routine housekeeping procedures. Where possible, use a HEPA vacuum to clean up the spilled material. If sweeping is necessary, use a dust suppressant and place materials in closed containers. Do not use compressed air for clean-up. Avoid clean up procedures that could result in water pollution.

7 . . . HANDLING AND STORAGE

Adapt your work practices to limit handling which can be a source of dust emission.

Avoid damaging the packaging and keep closed when not in use.

8 . . .EXPOSURE CONTROL / PERSONAL PROTECTION

. . . Hygiene standards and exposure limits

Industrial hygiene standards and occupational exposure limits vary between countries and local jurisdictions. Check which exposure levels apply to your facility. If no regulatory dust or other standards apply, a qualified industrial hygienist can assist with a specific workplace evaluation including recommendations for respiratory protection. Examples of exposure limits applying (in October 1999) to glass fibers in different countries are given below :

3 . . . HAZARD IDENTIFICATION

May cause mild mechanical irritation to skin, eyes and upper respiratory tract.

4 . . . FIRST AID MEASURES

Skin : In case skin irritation rinse affected areas with water and wash gently.

Eyes : In case of serious eye contact flush abundantly with water; have eye bath available.

5 . . . FIRE FIGHTING MEASURES

Non combustible products.

Use extinguishing media appropriate to the surrounding fire.

6 . . . ACCIDENTAL RELEASE MEASURES

Avoid creating dust. Provide workers with respirators if necessary (see section 8). Follow routine housekeeping procedures. Where possible, use a HEPA vacuum to clean up the spilled material. If sweeping is necessary, use a dust suppressant and place materials in closed containers. Do not use compressed air for clean-up. Avoid clean up procedures that could result in water pollution.

7 . . . HANDLING AND STORAGE

Adapt your work practices to limit handling which can be a source of dust emission.

Avoid damaging the packaging and keep closed when not in use.

8 . . .EXPOSURE CONTROL / PERSONAL PROTECTION

. . . Hygiene standards and exposure limits

Industrial hygiene standards and occupational exposure limits vary between countries and local jurisdictions. Check which exposure levels apply to your facility. If no regulatory dust or other standards apply, a qualified industrial hygienist can assist with a specific workplace evaluation including recommendations for respiratory protection. Examples of exposure limits applying (in October 1999) to glass fibers in different countries are given below :

Germany
0.5 f/ml
TRGS 900, Bundesarbeitsblatt 4/1999

France
1.0 f/ml or 5mg/m^3
Circulaire DRT No 95-4 du 12.01.95

UK
2.0 f/ml or 5mg/m^3
HSE - EH40 - Maximum Exposure Limit

** Time weighted average numerical concentrations of airborne respirable fibers measured by the conventional membrane filter method or gravimetric concentration of inhalable dust.*

. . . Engineering controls

Review your applications in order to identify potential sources of dust exposure. Local exhaust ventilation, dust collection at source, down draft tables, emission controlling tools and materials handling equipment can all be used to control dust generation and dispersion.

. . . Personal protective equipment

Wear long-sleeved, loose-fitting clothing and gloves to prevent skin irritation.

Goggles or safety glasses with side shields may be worn to prevent eye irritation, especially in case of over head working.

When it is not possible to reduce dust through engineering controls, employees are encouraged to use good working practices together with respiratory protective equipment (RPE). For dust concentrations below the exposure limit value, RPE is not required but FFP2 respirators may be used on a voluntary basis. For short term operations where exposures above the limit value are less than a factor of ten, use FFP2 respirators. In case of higher concentrations, please contact your supplier for advice.

. . . Information and training of workers

Workers should be trained on good working practices and informed on applicable local regulations.

9 . . . PHYSICAL AND CHEMICAL PROPERTIES

Odor
None
Melting point
> 1330°C
Flammability
None
Explosive properties
None
Length weighted geometric mean diameter
> 1.5 µm

10 . . . STABILITY AND REACTIVITY

Upon heating above 900°C for sustained periods, this amorphous material begins to transform to mixtures of crystalline phases. For further information please refer to section 16.

11 . . . TOXICOLOGICAL INFORMATION

. . . Irritant properties

When tested using approved methods (Directive 67/548/EEC, Annex 5, Method B4), fibers contained in this material give negative results. All man-made mineral fibers, like some natural fibers, can produce a mild irritation resulting in itching or rarely, in some sensitive individuals, in a slight reddening. Unlike other irritant reactions this is not the result of allergy or chemical skin damage but is caused by mechanical effects.

. . . Respiratory toxicity

CMS wools have been tested for their biopersistence using methods devised by the European Union. The biopersistence values measured exonerate CMS wools from carcinogen classification under the criteria listed in nota Q of Directive 97/69/EC.

Subchronic inhalation studies on rats with CMS wools at high concentration (150 f>20µm/ml) for 90 days with follow up to one year showed neither sustained inflammation nor cell proliferation. All parameters studied returned rapidly to baseline levels on cessation of exposure.

In a lifetime carcinogenicity test, rats were exposed by inhalation for two years (5 days a week, 6 hours a day) to CMS wool at 200 WHO f/ml. There was neither fibrosis nor carcinogenic response.

After service, CMS wools can contain various crystalline phases including some forms of silica (see section 16).

CMS samples kept at 1000°C for two weeks were not cytotoxic to macrophage-like cells at concentration up to 320µg/cm^2. In the same test, samples of pure crystalline quartz were significantly active at 20 µg/cm^2.

12 . . . ECOLOGICAL INFORMATION

No adverse effects of this material on the environment are anticipated.

13 . . .DISPOSAL CONSIDERATIONS

Waste from this product is not classified as ”hazardous” or ”special” under European Union regulations. Disposal is permitted at landfills licensed for industrial waste. Check for local regulations which may apply. To prevent materials becoming airborne, a covered container or plastic bagging is recommended.

14 . . .TRANSPORT INFORMATION

Not classified as dangerous goods under relevant international transport regulations.

Ensure that dust is not wind blown during transport.

15 . . .REGULATORY INFORMATION

. . . Classification among dangerous substances

Regulatory status comes from European Directive 97/69/EC and its implementations by the Member Sates.

According to Directive 97/69/EC the fiber contained in this product is a mineral wool belonging to the group of ”man-made vitreous (silicate) fibers with random orientation with alkaline oxide and alkali earth oxide ($Na_2O+K_2O+CaO+MgO+BaO$) content greater than 18% by weight”.

Under Directive 97/69/EC all types of man-made vitreous (silicate) fibers are classified as ”irritant” despite the fact that testing by the appropriate EU method (B4 in annex 5 of Directive 67/548/EEC) is providing no response and would not result in irritant classification.

Under criteria listed in nota Q of Directive 97/69/EC, CMS wools are exonerated from carcinogen classification because of low pulmonary biopersistence.

. . . Protection of workers

Shall be in accordance with several European Directives and their implementations by the Member States:

(a) Council Directive 80/1107/EEC as amended by Directive 88/642/EEC ” on the protection of workers from the risks related to exposure to chemical, physical and biological agents at work ”.

(b) Council Directive 89/391/EEC ”on the introduction of measures to encourage improvements in the safety and health of workers at work”.

(c) Council Directive 98/24/EC ”on the protection of workers from the risks related to chemical agents at work”.

. . . Other possible regulations

Member States are in charge of implementing European Directives into their own national regulation within a period of time normally given in the Directive. Member States may impose more stringent requirements. Please always refer to any applicable regulation.

16 . . .OTHER INFORMATION

. . . Useful References

Commission Directive 97/69/EC of 5 December 1997 adapting to technical progress for the 23rd time Council Directive 67/548/EEC on the approximation of the laws, regulations and administrative provisions relating to the classification, packaging and labeling of dangerous substances. Official Journal of the European Communities, 13 December 1997, L 343 and any Member State implementation. Council Directive 98/24/EC of 7 April 1998 on the protection of the health and safety of workers from the risks related to chemical agents at work. Official Journal of the European Communities, 5 May 1998, and any Member State implementation.

. . . Precautionary measures to be taken after service and upon removal

Because high concentrations of fibres and other dusts may be generated when after-service products are mechanically disturbed during operations such as wrecking, ECFIA recommends:

a) control measures are taken to reduce dust emissions and

b) all personnel directly involved wear an adapted respirator to minimize exposure and comply with local regulatory limits.

These procedures will ensure compliance with local regulatory exposure standards for free crystalline silica. And because devitrified fibers containing silica mixed with amorphous and other crystalline phases are far less biologically active than free crystalline silica dusts, these measures will provide a high degree of protection

. . . . ECFIA Web Site

For more information connect to the ECFIA web site: www.ecfia.org

disturbed during operations such as wrecking, ECFIA recommends:

a) control measures are taken to reduce dust emissions and

b) all personnel directly involved wear an adapted respirator to minimize exposure and comply with local regulatory limits.

These procedures will ensure compliance with local regulatory exposure standards for free crystalline silica. And because devitrified fibers containing silica mixed with amorphous and other crystalline phases are far less biologically active than free crystalline silica dusts, these measures will provide a high degree of protection

. . . . ECFIA Web Site

For more information connect to the ECFIA web site: www.ecfia.org

Troubleshooting Guide

To obtain the best results from your Beech Oven, please read the Installation and Operation Manual in it's entirety before operation. Should a fault or complication arise, please read the following Troubleshooting guide to determine a possible source and solution to the problem.

If after having read this manual and followed the instructions in the Troubleshooting guide failed to resolve the problem, please contact Beech Ovens Technical Support at technical@beechovens.com.au

Note: *Always ensure that **both power and gas are turned off** before any troubleshooting or maintenance is carried out. In addition to having the Installation and Operation Manual in hand, Beech Ovens recommend the following tools as standard when troubleshooting: Approved Gas Pressure gauge, Multimeter, Digital (or analogue) Temperature gauge and a standard range of hand tools including wrenches, pliers and screwdrivers*.

The following guide is a list of the most common problems encountered when using a Beech Oven.

Problem / Symptom	Possible Cause	Solution / Reference chapter in Installation and Operation Manual
1. Smell of gas near oven.	**1.1** Possible gas leakage - **Do NOT operate oven.**	**1.1.1** Refer to **Gas Systems Overview**. **1.1.2** Turn off main gas supply at Manual Gas Isolation Valve in Gas Control Cabinet. Contact service technician.
2. Burner fails to ignite – spark heard *(evident)* at Tri-electrode.	**2.1** Gas supply problems. *(For LPG, is tank near empty?)* **2.2** Contamination on Tri-electrode – debris, etc. **2.3** Spark is shorting to metallic surface. **2.4** Tri-Electrode not in correct position or misaligned. **2.5** Air in Gas line. **2.6** Faulty Flame pack. **2.7** Faulty Gas valve(s). **2.8** Tri-electrode cables incorrectly fitted to Tri-electrode or flame pack	**2.1.1** Check gas supply *(Contact service technician).* **2.2.1** Refer to **Tri-electrode and Burner Maintenance.** **2.3.1** Refer to **Tri-Electrode/ Igniter Assembly.** **2.4.1** Refer to **Tri-electrode and Burner Maintenance.** **2.5.1** Refer to **Connection Procedures**. **2.6.1** Replace Flame pack. **2.7.1** Replace Gas Valve(s). **2.8.1** Refer to **Tri-Electrode/ Igniter Assembly.**
3. Burner fails to ignite – no spark heard under the oven *(at burner)*	**3.1** Gas supply problems. *(For LPG, is tank near empty)* **3.2** No power to control cabinet - circuit breaker in Gas Control cabinet tripped. **3.3** Tri-Electrode cables faulty/ connections dirty/ fallen off. **3.4** No power to Flame Pack. **3.5** Faulty Flame pack. **3.6** 'SV' setting below 'PV' on Digital Temperature Controller. **3.7** Faulty Thermocouple.	**3.1.1** Check gas supply *(Contact service technician).* **3.2.1** Check power supply. Refer to **Gas Systems Overview.** **3.3.1** Refer to **Connection Procedures**. **3.4.1** Check power supply. **3.5.1** Replace Flame pack. **3.6.1** Refer to **Digital Temperature Controller.** **3.7.1** Do **NOT** build fire on Thermocouple. **3.7.2** Replace Thermocouple.

4. Soot deposits on roof and/or walls.	**4.1** Gas supply problems. *(For LPG, is tank near empty)* **4.2** Incorrect gas pressure setting. **4.3** Inspirator air adjustment incorrectly calibrated. **4.4** Flame misaligned in tube *(impinging "touching" shroud).* **4.5** Debris fallen onto burner *(nozzle ports).* **4.6** Leaking gas connection at burner. **4.7** Insufficient ventilation for primary air below oven. **4.8** Restriction of secondary air into the oven cavity. **4.9** Impurity in gas supply. **4.10** Incorrect jet/orifice.	**4.1.1** Check gas supply *(Contact service technician).* **4.2.1** Refer to **Flame Calibration.** **4.3.1** Refer to **Inspirator Calibration.** **4.4.1** Check shroud location, positioned correctly in floor. **4.5.1** Refer to **Tri-electrode and Burner Maintenance.** **4.6.1** Refer to **Connection Procedures.** **4.7.1** Refer to **Venting the Oven.** **4.8.1** Remove restriction. **4.9.1** Check gas supply *(Contact service technician).* **4.10.1** Contact service technician.
5. Burner fails to remain alight – dies after a few seconds.	**5.1** Tri-electrode misaligned to flame **5.2** Tri-electrode dirty/faulty - *(cracked ceramic)* **5.3** Lead connection from Flame pack to Tri-electrode dirty/faulty/fallen off. **5.4** Flame pack faulty or beginning to fail **5.5** Gas supply/pressure problems. **5.6** Ventilation problem, flame being drawn under the oven floor. **5.7** Colour coded Tri-electrode cables incorrectly fitted to Tri-electrode. **5.8** Polarity of the electrical wall socket is incorrect	**5.1.1** Refer to **Tri-electrode and Burner Maintenance.** **5.2.1** Refer to **Tri-electrode and Burner Maintenance.** **5.3.1** Refer to **Connection Procedures.** **5.4.1** Replace Flame pack. **5.5.1** Refer to Flame Calibration *(Contact service technician).* **5.6.1** Refer to **System Balancing** or www.beechovens.com **5.7.1** Refer to **Tri-Electrode/ Igniter Assembly.** **5.8.1** Refer to Electrical Connection in Installation manual
6. Smoke spillage from oven mouth	**6.1** Incorrect flue system damper calibration. **6.2** Fan failure. **6.3** Flue blocked/ Dirty. **6.4** Wind or breeze interrupting normal operation. **6.5** Excessive smoke production.	**6.1.1** Refer to **System Damper Calibration.** **6.2.1** Replace fan *(Contact service technician).* **6.3.1** Clean Flue. Refer to **Oven Maintenance.** **6.4.1** Refer to **System Balancing** or www.beechovens.com **6.5.1** Incorrect wood selection (Refer to Firing with Wood).
7. Excessive heat in flue *(over 180°C)*	**7.1** Incorrect system damper calibration **7.2** Fan failure. **7.3** Flue blocked/ Dirty. **7.4** Spray Filter/Flue Transition - "Cool air make-up" problems.	**7.1.1** Refer to **System Damper Calibration.** **7.2.1** Replace fan *(Contact service technician).* **7.3.1** Clean Flue. Refer to **Oven Maintenance.** **7.4.1** Refer to **Cool Air Make-up Check.**
8. Oven won't get hot enough.	**8.1** Gas supply problems. (For LPG, is tank near empty) **8.2** Incorrect system damper calibration. **8.3** Problem with gas system temp controller. **8.4** 'SV' setting to low on Digital Temperature Controller. **8.5** Insufficient wood fire/wood selection. **8.6** Plug door(s) incorrectly positioned. **8.7** Ventilation problem, flame being drawn under the oven floor. **8.8** Initial warm-up too short. **8.9** Wood fire built on top of Thermocouple.	**8.1.1** Check gas supply *(Contact service technician).* **8.2.1** Refer to **System Damper Calibration.** **8.3.1** Refer to **Gas System Overview.** **8.4.1** Refer to **Digital Temperature Controller.** **8.5.1** Refer to **Firing up to Cook / Wood Fired Ovens.** **8.6.1** Refer to **Plug Door Placement.** **8.7.1** Refer to **Oven Ventilation** or www.beechovens.com **8.8.1** Refer to **Firing up to Cook.** **8.9.1** Move fire away from Thermocouple.

9. Gas flame turns off before 'SV' setting is reached.	**9.1** Faulty Thermocouple. **9.2** Ventilation problem, flame being drawn under the oven floor. **9.3** Faulty Digital Temperature Controller. **9.4** Flame sensor dirty/ Faulty. **9.5** Over-Temperature Sensor in flue cutting off gas supply. (Australian ovens only - AS5601 interlock)	**9.1.1** Replace Thermocouple. **9.2.1** Refer to **System Balancing** or www.beechovens.com **9.3.1** Replace Digital Controller. **9.4.1** Refer to **Tri-electrode and Burner Maintenance.** **9.5.1** Refer to **Interlock System – Australian markets ONLY.**
10. Gas flame remains on high fire.	**10.1** 'SV' setting too high on Digital Temperature Controller. **10.2** Faulty Thermocouple. **10.3** Thermocouple positioned incorrectly or fallen out of oven **10.4** Incorrect gas pressure adjustment. **10.5** Faulty Digital Controller. **10.6** Faulty Flame pack.	**10.1.1** Refer to **Digital Temperature Controller.** **10.2.1** Replace Thermocouple. **10.3.1** Refer to **Thermocouple.** **10.4.1** Refer to **Flame Calibration.** **10.5.1** Replace Digital Temperature Controller. **10.6.1** Replace Flame pack.
11. Gas remains on low fire.	**11.1** Gas supply problems. (For LPG, is tank near empty) **11.2** Incorrect gas pressure adjustment. **11.3** 'SV' setting below 'PV' on Digital Temperature Controller. **11.4** Wood fire built on Thermocouple. **11.5** Incorrect position of Thermocouple. **11.6** Faulty Flame pack. **11.7** Faulty Digital Temperature Controller. **11.8** Faulty Gas Combination valve.	**11.1.1** Check gas supply *(Contact service technician).* **11.2.1** Refer to **Flame Calibration.** **11.3.1** Refer to **Digital Temperature Controller.** **11.4.1** Move fire away from Thermocouple. **11.5.1** Refer to **Thermocouple.** **11.6.1** Replace Flame pack. **11.7.1** Replace or re-programme Digital Temp. Controller. **11.8.1** Replace Gas Combination valve.
12. Gas turns off instead of going to low fire.	**12.1** Incorrect gas pressure adjustment. **12.2** 'PV' exceeding 'SV' temperature on Digital Temperature Controller. **12.3** Over-Temperature Sensor in flue cutting off gas supply. (Australian ovens only. AS5601 Interlock) **12.4** Faulty Digital Temperature Controller. **12.5** Faulty Gas Combination valve. **12.6** Faulty Flame pack. **12.7** Ventilation problem, flame being drawn under the oven floor.	**12.1.1** Refer to **Flame Calibration.** **12.2.1** Refer to **Digital Temperature Controller.** **12.3.1** Refer to **Interlock System – Australian markets ONLY.** **12.4.1** Replace or re-programme Digital Temp. Controller. **12.5.1** Replace Gas Combination valve. **12.6.1** Replace Flame pack. **12.7.1** Refer to **System Balancing** or www.beechovens.com
13. Gas flame intermittent/erratic.	**13.1** Gas supply problems. (For LPG, is tank near empty) **13.2** Ventilation problem, flame being drawn under the oven floor. **13.3** Wood fire on top of Thermocouple. **13.4** Power supply interruptions. **13.5** Check 'SV' setting on Digital Temperature Controller. **13.6** Inspirator air adjustment incorrectly calibrated. **13.7** Inspirator/Burner nozzle dirty. (build up of charcoal or debris)	**13.1.1** Check gas supply *(Contact service technician).* **13.2.1** Refer to **System Balancing** or www.beechovens.com **13.3.1** Move fire away from Thermocouple. **13.4.1** Check power supply *(Contact electrician).* **13.5.1** Refer to **Digital Temperature Controller.** **13.6.1** Refer to **Inspirator Calibration.** **13.7.1** Refer to **Tri-electrode and Burner Maintenance.**

14. Fault/Reset light comes on.	**14.1** Gas supply problems. (For LPG, is tank near empty) **14.2** Ventilation problem, flame being drawn under the oven floor. **14.3** Tri-electrode dirty, contaminated, loose etc. **14.4** Leads to Tri-electrode faulty/fallen off. **14.5** Faulty Flame pack. **14.6** Faulty Gas Combination valve. **14.6** Air in gas lines. (refer to Connection procedures)	**14.1.1** Check gas supply *(Contact service technician).* **14.2.1** Refer to **System Balancing** or www.beechovens.com **14.3.1** Refer to **Tri-electrode and Burner Maintenance.** **14.4.1** Refer to **Connection Procedures.** **14.5.1** Replace Flame pack. **14.6.1** Replace Gas Combination valve. **14.7.1** Refer to **Connection Procedures.**
15. Gas burner not turning off.	**15.1** Thermocouple faulty / fallen out. **15.2** Faulty Digital Temperature controller **15.3** Check 'SV' setting on Digital Temperature Controller. **15.4** Faulty Flame pack.	**15.1.1** Refer to **Thermocouple**. Replace if faulty. **15.2.1** Refer to **Digital Temperature Controller.** **15.3.1** Refer to **Digital Temperature Controller.** **15.4.1** Replace Flame pack.
16. No lights on Gas Control cabinet *(Digital Temp Controller/ Burner ON).*	**16.1** Power supply problems. **16.2** Circuit breaker inside cabinet tripped. **16.3** Bulbs faulty - blown	**16.1.1** Check power supply *(Contact electrician).* **16.2.1** Check power supply. Refer to **Gas Systems Overview.** **16.3.1** Replace bulbs
17. Flame leaking out from blow back chute.	**17.1** Incorrect System Balancing **17.2**. Ventilation problem, flame being drawn under the oven floor.	**17.1.1** Refer to **System Balancing.** **17.2.1** Refer to **Oven Ventilation.**
18. Excessive Gas consumption.	**18.1** Incorrect System Damper calibration. Oven loosing heat. **18.2** Incorrect door position. **18.3** Incorrect flame calibration. **18.4** Incorrect gas pressure adjustment. **18.5** Leakage in supply line. **18.6**. Ventilation problem, flame being drawn under the oven floor. **18.7** Incorrect jet /orifice	**18.1.1** Refer to **System Damper Calibration.** **18.2.1** Refer to **Plug Door Placement.** **18.3.1** Refer to **Flame Calibration.** **18.4.1** Refer to **Flame Calibration.** **18.5.1** Turn off main gas supply at Manual Gas Isolation Valve in Gas Control Cabinet. Contact service technician. **18.6.1** Refer to **System Balancing** or www.beechovens.com **18.7.1** Contact service technician
19. Cracked upper refractory.	**19.1** Insufficient Preheating of the oven.	**19.1.1** Refer to **Preheating with Gas / Wood.**
20. Burner flame popping loud on startup	**20.1** Tri-electrode misaligned to flame **20.2** Build up of charcoal or debris on burner	**20.1.1** Refer to **Tri-electrode and Burner Maintenance.** **20.2.1** Inspect and clean burner

Index

A

A4 Paper Test 70
access panel 52
Adjustments for Normal use 88
A-Frame 16
Air Circulation Gap 19
air/gas mixture 80
ash disposal container 13
Assembly 16

B

Barometric Controller 29, 69
Base 11
blow-back chute 72
burner/ inspirator 53

C

Canopy Method 34
CE Specifications 120
ceramic wool 17, 18
Char-Grill 10, 43, 94
Combination Gas valve 44
Combustible floors 13
Commissioning 67
Commissioning Check Sheet 84
Connection Procedures 53
Contents 3
cool air make-up device 30, 69
Cracking 86
current oven temperature 46, 91
cyclonic filter 22, 30

D

dedicated fan 29
dedicated flue 29
Digital Temperature controller 46, 91
Display burner 47
Disposal of ashes 8
Duck Oven thermocouple 51

E

earth probe 48
ECFIA General MSDS 122
electricity supply 64
emergency manual gas isolation valve 44
Excessive draw 73
Exhaust duct design 27
Exhaust Fan 29
exhaust gas 25
exhaust system 28
Existing System 29

F

FAULT/ RESET 67
Fault/ Reset button 46, 91
Finishing for the Day 96
Firing up to Cook 89
fitting the insulation to the oven 19
Flame Calibration 75
flame characteristics 80
flame failure 48
Flame Pack 47, 48, 54
Flue Fires 34
Flue Material 27
Flue Transition 21
FR nozzle burner 47
Full Gas 43

G

Gas back-up 43
Gas Char Grill 47
gas management system 43
General Technical Details 119

H

High Flame 77, 92
High Flame pressure 77
High volume extraction 29

I

Inlet *(supply)* pressure 76
inspection/ cleaning ports 21
inspirator 53, 80
Installation Check Sheet 83
Installation Procedure 14
Interlock System 24
interlock temperature controller 25
Interlock Thermocouple 25
isolator 64

K

Kaogrip 18
kindling 87

L

lifting frame 16
Lifting Positions 14
Lighting the burners (Char-Grill) 94
lock-out mode 46, 91
Low Flame 92
Low Flame pressure 78
Low volume extraction 29

M

Main Control Switch 45, 90
making a fire 87
misting spray 30
mounting flange 53

N

Natural Draft 28
Nominal airflow required 27

O

Optimum temperature 89
Outlet pressure 77
oven materials 121

P

Piezo 95
Piezo Battery 95
pizza base 89
Plug Door 96, 97
polarity 64
Power flue 24
Preheating with Gas 86
Preheating with Wood 87
Pressure Adjustment screws 77
purging of the gas line 67
PV- Present Value 46, 91

Q

quadrant adjuster 70

R

reticulated gas supply 56

S

secondary air 72
set point temperature 67
shroud 55
Sit Nova 75
spigot 18
spigot cleaning brush 96
Spotlight Connection 63
Spotlight Maintenance 111
Spray Filter 22, 30
Spray Filter - Technical Specifications 23
Spray Filter Connection 58
Spray Filter Maintenance 112
sprinkler head 34
Stainless Steel Hearth 20
stairs 13
standby mode 92
SV – Set point value 46, 91
System Balancing 73
System Damper 21, 68
System Damper Calibration 68

T

test gauge 77
thermal input 43
Thermocouple 49
Thermocouple probe 55
Transportation 15
Tri-electrode 48, 54
Tube Burner Ventilation 38

U

Upper Refractory 11

V

vent 52
Ventilation Requirement 37
Venting the Oven 52
viewing window 109

W

warranty document 6
Water Supply Sensor 26
Window Installation 59
Window Vent Connection 62